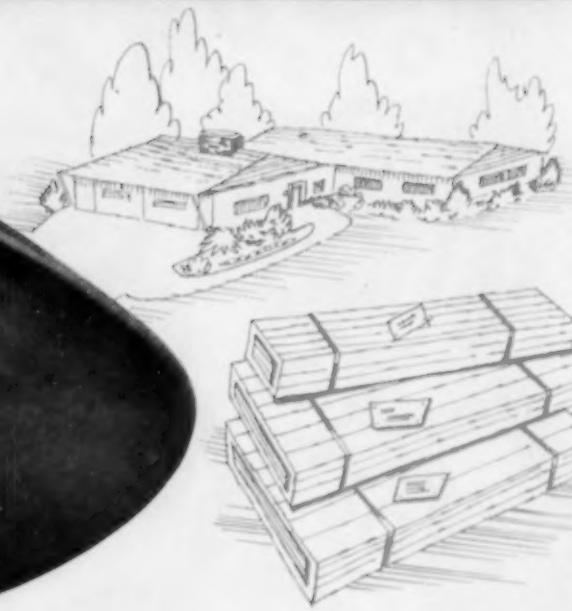
JULY 11, 1955

STEEL

The Metalworking Weekly



PREFAB HOUSING

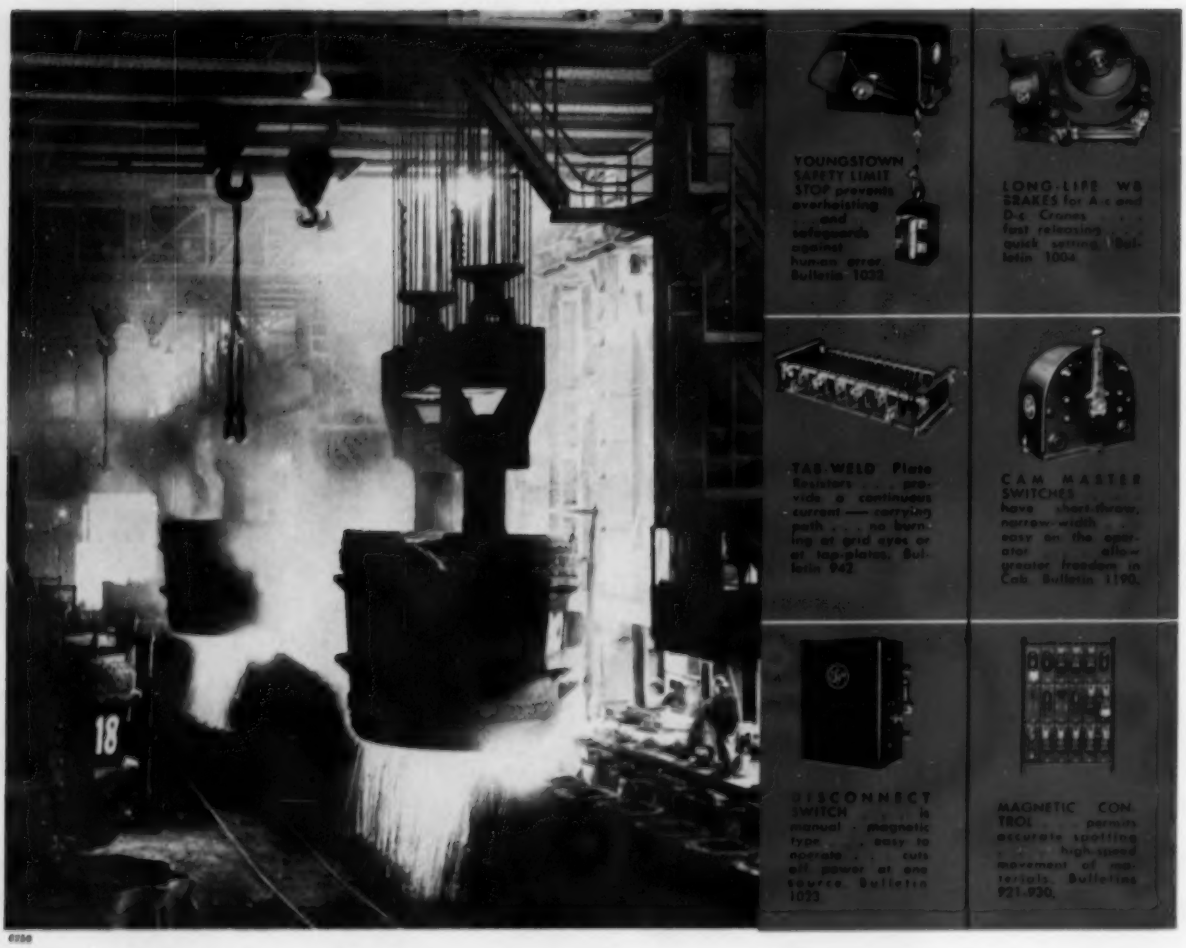
...means standardized markets for metalworking, says National Homes Corp.'s James R. Price—page 55

CONTENTS—PAGE 5

Crane Control...engineered to order by EC&M

King size or regular . . . from giant ladle cranes to standard production cranes, EC&M designs the Control equipment specifically for each crane. All control components are engineered and coordinated from the crane data sheet. EC&M uses this method of manufacture to assure precise performance. Operation is smooth . . . response is fast . . . ability to secure accurate inching and quick maneuverability is unsurpassed.

When revamping existing installations or buying new cranes, specify EC&M for complete control . . . control that is engineered to order.


YOUNGSTOWN SAFETY LIMIT STOP prevents overhoisting . . . and safeguards against human error Bulletin 1032
LONG-LIFE WB BRAKES for A-c and D-c Cranes . . . fast releasing, quick setting. Bulletin 1004
TAB-WELD Plate Resistors . . . provide a continuous current — carrying path . . . no burning at grid eyes or at tap-plates. Bulletin 942
CAM MASTER SWITCHES have short-throw, narrow-width . . . easy on the operator . . . allow greater freedom in Cab. Bulletin 1190.
DISCONNECT SWITCH . . . is manual - magnetic type . . . easy to operate . . . cuts off power at one source. Bulletin 1033.
MAGNETIC CONTROL . . . permits accurate spotting . . . high-speed movement of materials. Bulletins 921-930.

6230

For a complete line of crane control

specify **EC&M**

THE ELECTRIC CONTROLLER & MFG. CO.

4498 Lee Road • Cleveland 28, Ohio

There's Never Any Question About a Bethlehem Drop Forging

You can be sure of top quality in a drop forging made by Bethlehem.

You can be sure that the steel is right, that the dies are right. You can be sure that the forging work is done conscientiously by men long skilled in their trade.

Bethlehem shops furnish an almost endless variety of designs for the oil, mining, aviation, automotive, electrical, and other industries. Both quality and variety are made possible by excellent facilities, which include modern die-sinking shops, steam and board drop hammers to 8,000 lb, mechanical presses to 3,000 tons, upsetters to 9 in., and full heat-treating equipment.

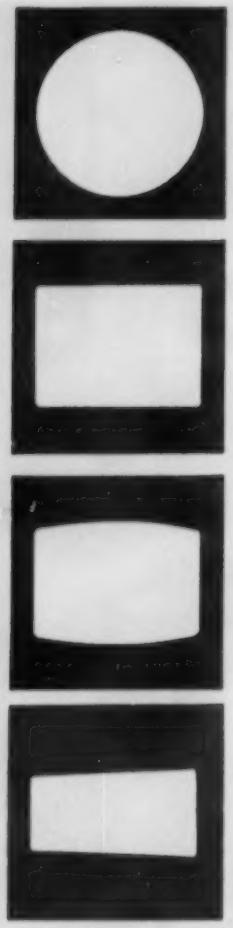
When you are figuring your next requirements for closed-die forgings, we'd appreciate the chance to talk with you. We offer excellent service, a first-class product, and competitive prices and deliveries.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



Ball Bearings

Cylindrical Roller Bearings

Spherical Roller Bearings

And now

Tyson **Tapered Roller Bearings***

The broadest product line in the anti-friction field.

SKF—and its field engineers—are now adding Tyson Tapered Roller Bearings to their recommendations.

Constantly working to broaden the SKF line—to make "the right bearing in the right place" a watchword throughout industry, SKF has recently introduced new lines of pillow blocks, styles and sizes of Max type ball bearings, the improved Type "C" Spherical roller bearing.

And *now* SKF offers Tyson Tapered Roller Bearings.

This means that from SKF you get the broadest range of types and sizes of anti-friction bearings *and* the most extensive anti-friction experience.

More today, than ever before, dealing with SKF Field Engineers assures you of the right bearing in the right place. 7844

SKF®

BALL AND ROLLER BEARINGS

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.,
manufacturers of SKF *and* HESS-BRIGHT® *bearings.*

*Manufactured by TYSON BEARING CORP., affiliated with SKF Industries, Inc. as a subsidiary.

From Airplane Wing Skins to Structural Shapes

No Matter What You Roll

you're sure to win
"PRODUCTION OSCARS"
with Kling
ANGLE or PLATE ROLLS

You can duplicate the happy experience of Douglas Aircraft Co., Inc. with Kling-Pope Plate Rolls; and of Commercial Tank & Welding Co. with Kling Angle Rolls. These are only two of the many plants that have captured coveted "Production Oscars" for performance records on diverse jobs with Kling Rolls.

Kling's sixty-three year engineering and production experience —always at your service—is concentrated into all the many Kling Metal Fabricating Machines. Send for bulletins on the specific machines in which you are interested or New Complete Line Folder.

A. No. ½ Kling Angle Roll with Power Raise

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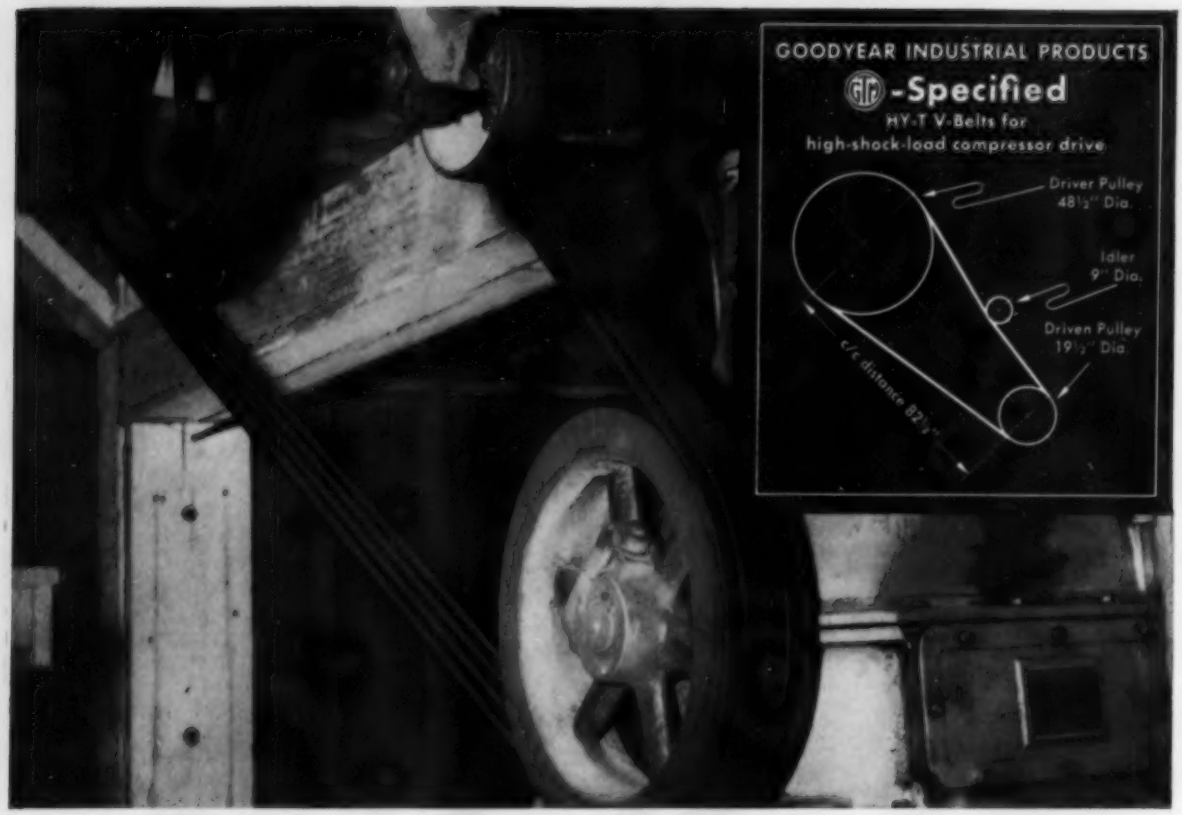

Saved the cost of 3 sets of belts

and still going strong on tough compressor drive

BELT-BREAKING problem for a Southern lumber company was overloading on a compressor drive. Frequent and sudden shock-loads kept belt-life down to 6 months, meant costly shutdowns and expensive replacements.

Called in for consultation, the G.T.M.—Goodyear Technical Man—recommended HY-T V-Belts. Their multiple plies of chemically produced 3-T CORD are tempered by Time, Tension and Temperature to eliminate surplus stretch. They can carry 40% greater horsepower loads at speeds from 100 to 6,000 f.p.m.—have maximum resistance to oil, moisture, mildew and static generation.

Result: The HY-T V-Belts easily took the shock-loads in stride, are still running after 24 months—4 times the service life of the standard V-belts they replaced—saving the cost of 3 sets of belts to date.

If you have drive troubles call in the G.T.M.—the man who knows V-belts best. Contact him through your Goodyear Distributor or by writing to:

Goodyear, Lincoln, Nebraska or Akron 16, Ohio

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

Hy-T—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

HY-T V-BELTS with 3-T CORD by

GOODYEAR

THE GREATEST NAME IN RUBBER

STEEL
The Metalworking Weekly

JULY 11, 1955
Vol. 137 No. 2

METALWORKING OUTLOOK, 39

The Editor's Views, 43

Look at the Small Print in Auto Contracts, 47
Some surprising hedges crop up

Bearings Bear Up, 49
Sales prospects are good for ball and roller units

Big Spring, Little Spring, 50
Taking the work out of opening doors

Bowser Inc. Goes Traveling, 51
A road show displays its diversified products

Prefabs Come of Age, 55
Here's a growing market for metalworking

Windows of Washington, 52
Mirrors of Motordom, 59
The Business Trend, 63
Men of Industry, 67
New Products, 111
Behind the Scenes, 6
Letters to the Editors, 10
Calendar of Meetings, 25
Machine Topics, 103
New Literature, 124

TECHNICAL OUTLOOK, 87

Heat Treating Magnesium, 88
How to get the most from the lightest commercial metal

Module Units Speed Subassembly, 92
They add flexibility to materials handling on line

What Vacuum Holds for Precision Casting, 94
There's more to it than removing gas from the melt

Simplify Dump-Track Maintenance, 96
Multipurpose grader keeps the slag track in the clear

Opportunity Knocks for Gas Plating, 106
A process with great potential waits for industry to call

MARKET OUTLOOK, 127

Steel Operations, 127
Price Comparisons, 128
Nonferrous Roundup, 130
Nonferrous Prices, 132
Steel Prices, begin 134
Scrap Prices, 152

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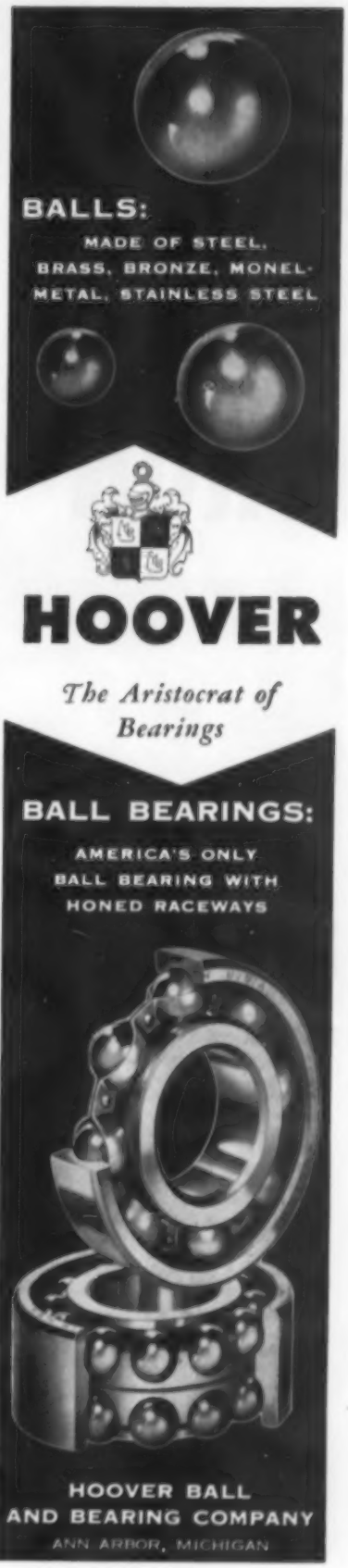

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- Our plant is better than ever
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It includes:

The
HANNA 38-POUND PIG

The foundryman's favorite standard pig. Available in all grades, silvery and HannaTite. A good example of the quality that has made Hanna "the best known name in iron."

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EXCLUSIVE HANNATEN INGOT

For 10-lb.-pig users, this new ingot means no free-carbon pockets, finer grain structure, more even melting. Available in all grades, silvery and HannaTite—an extra-close-grain iron.

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NATIONAL STEEL CORPORATION

behind the scenes

Gossip from Overseas

Early this summer the German government, the German press and the German steel industry joined forces and invited Irwin H. Such, editor of STEEL, to visit their country. They intimated, in effect, that metalworking in Germany had recovered to such a remarkable extent it had to be seen to be believed. An American metalworking magazine editor, such as Herr Such, would see and hear so much on an industrial tour of the Fatherland he couldn't help reporting it in his widely read and highly respected journal; and Germany, naturally, wouldn't mind the favorable notice. Irwin accepted the invitation, and departed June 11. We didn't hear from him until June 27. He wrote:

"Anyone who hasn't flown the Atlantic has a new and thrilling experience ahead. We took off from New York in a Scandinavian Airlines DC-6B at 4 p.m., June 11, in a pea soup fog. Heading to the ocean is quite different from having the plane swing off toward Cleveland! And it was reassuring to have a couple of extra insurance policies."

(It must be nice to be that easily reassured, Irwin. We would have traded those policies for a parachute, a pair of water wings and an outboard motor.)

Counts Scottish Cows

"At 7 p. m. we caught a glimpse of Halifax, N. S., with its oil tanks and unloading tankers. Then on to Newfoundland . . . before long we were over islands to the north covered with snow and glaciers and surrounded by icebergs . . . my impressions of Scotland are most sketchy. We arrived at 10 a.m. after 13 hours in the air, and I managed to count 10,000 cows and 14,000 sheep as we flew in."

(There's an old story about counting cows in a hurry, and Irwin's rapid calculation makes us wonder. The story tells about a cattle buyer who was able, simply by glancing at a herd, to number them correctly. He explained that he counted the dugs and divided the total by four.)

"Visited the famous August Thyssen Steelworks in Duisburg, Germany, today with Dr. Paul Webber, head of the German commercial press relations, and our correspondent, Dr. Herbert Gross. This plant was almost completely dismantled when the Americans put a stop to it in 1949. Dr. Wolfgang Homberg, who runs the plant and was my host, feels kindly toward the U. S. A.

Hot Shots, Big Shots Everywhere

"The Thyssen works has been almost completely rebuilt with modern equipment—some from Wean, Farval, Hallden, Morgan Construction, Horsburgh & Scott, etc. Had dinner tonight with the director of the famous Krupp organization. It is like Ford, with assets of billions of dollars. Cyrus Eaton is in town to interest Krupp in the Ungava ore properties he owns in Labrador. Missed him, but Director Beitz will say 'hello' tomorrow. Expect to see Alfred Krupp June 23.

"On the plane coming over I met P. A. Svenssen of Edwards & Co., Sweden, who had just bought a tonnage of stainless steel from Washington Steel, Crucible Steel & Eastern Stainless Steel."

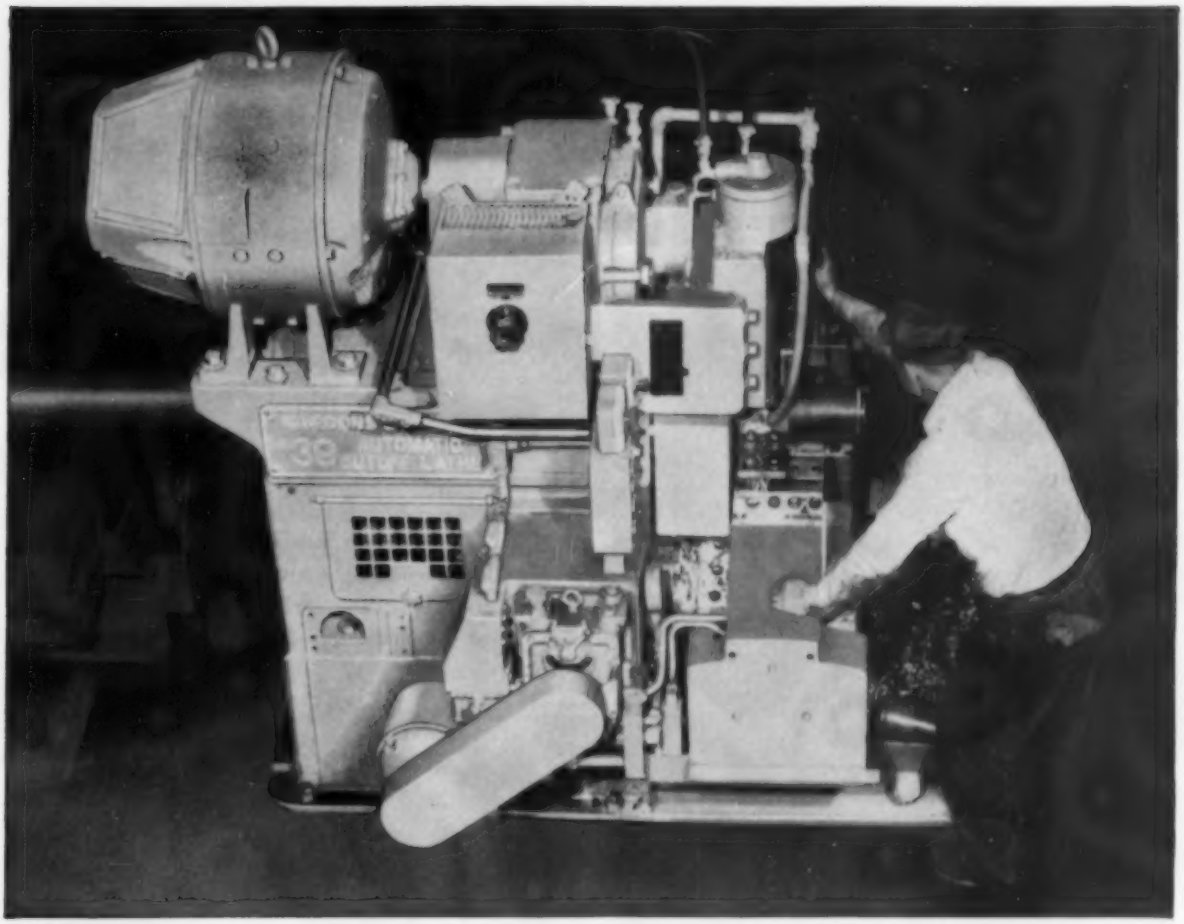
(If he accumulates notes in this fashion, it occurs to us that he may have to give up editing STEEL for a spell and go about filling speaking engagements. Do we hear any early reservations?)

Watch Them Hawgs

Don Horwitz, U. S. Bedding Co., St. Paul, measured Miss LaDow's lake and came up with the correct diameter before it evaporated: 1.114 miles. Ralph Bernotas, design engineer, Euclid Div., General Motors, Cleveland, solved in a hurry, too, and begged for a hard one. All right, Ralph. You boys are so used to operating in the upper strata of mathematics perhaps the simple problems might bother you. How many prime hawgs can sneak under a fence in an hour if ten prime hawgs sneak under a fence in 10 minutes?

Shrdlu

(Metalworking Outlook—Page 39)



Photograph courtesy of The Colorado Fuel and Iron Corporation

"Excellent Performance . . . Very Low Maintenance Cost"

AT

THE COLORADO FUEL and IRON CORPORATION

The Superintendent of The Colorado Fuel and Iron Corporation's new Seamless Mill reports *excellent performance* and *very low maintenance* cost on their Bardons & Oliver Cutoff Lathes. At present, the mill has in operation four pairs of Bardons & Oliver Crop End Cutoff Lathes cropping pipe 2⅜" to 9⅝" diameter. Two other machines are used for cutting coupling stock from 3.063" to 9⅝" diameter.

Many of the leading pipe and tube mills have standardized exclusively on Bardons & Oliver Cutoff Lathes. Over 60 years of manufacturing experience is your assurance of quality machines for continuous operation and high rates of production. Send your blueprints to Bardons & Oliver engineers for individual attention without obligation.

MANUFACTURERS OF A COMPLETE LINE OF TURRET LATHES AND CUTTING OFF LATHES

BARDONS & OLIVER, INC.

1147 WEST 9TH STREET • CLEVELAND 13, OHIO

Is there such a thing as...

A PRACTICAL REPLACEMENT PROGRAM?

YES! – and Jones & Lamson can help you develop it

Industry unanimously endorses the idea of planned replacement of capital equipment. Nevertheless, most of America's machine tools are more than 10 years old, sadly inferior to today's profit-producing equipment. The idea is sound — but action is lacking.

Biggest reason for this paradox is financial. Until recently, replacement required a substantial outlay of capital. In many cases, needed capital was lacking; in others, the capital, though available, had many other calls upon it. Unrealistically low depreciation allowances on capital equipment served as an added deterrent to replacement.

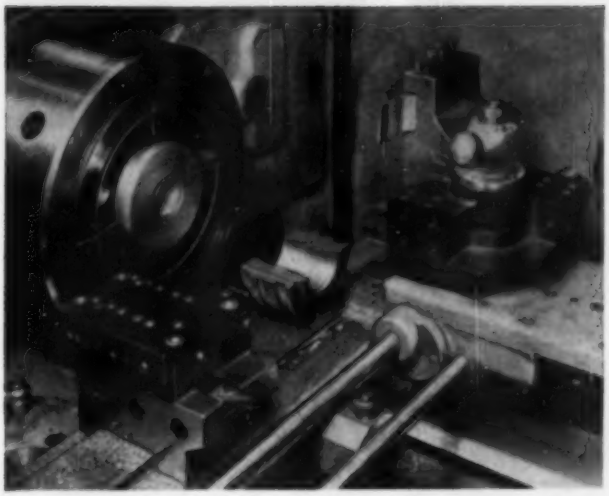
The picture has changed. Now, provisions of our new tax laws permit more equitable write-offs, and make replacement a more attractive proposition.

Jones & Lamson makes replacement even *more* feasible, by clearing away the traditional difficulties of financing with its unique Procurement Plans.

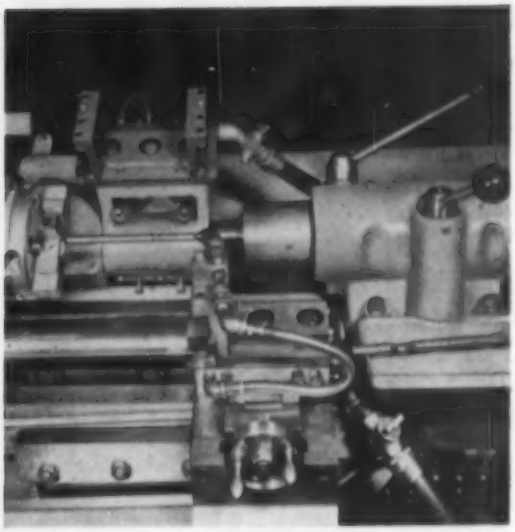
This, then, is what Jones & Lamson offers: modern machine tools that can greatly improve your production; *plus* your choice of several sound, low-cost (interest rates of 3¼%, and lower, add-on) methods of procuring these tools.

◀ **OBSOLETE** machine tools like these hamper industrial growth, keep production low, and costs high.

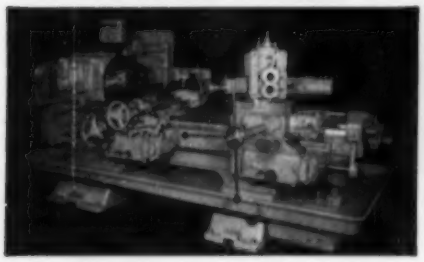
RESEARCH in machining methods, metallurgy, tool geometry, is carried on continually by J & L. Important findings have resulted in the incorporation of unique engineering features in J & L machines.



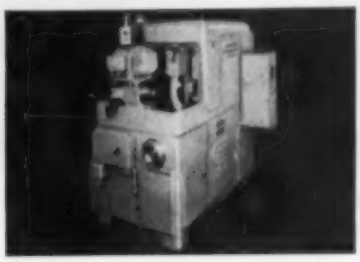
IMPROVED production on this difficult machining job was made possible by J & L engineers' close co-operation with the customer. Research testing, and incorporation of special features on a J & L turret lathe cut time-per-piece on this bottle neck-ring from 14 to 5½ min., increased production 120%!



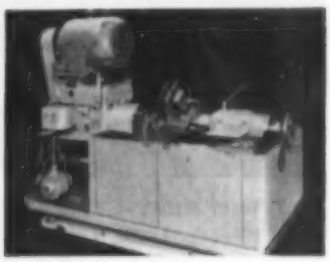
AUTOMATIC OPERATION. One Fay Automatic Lathe replaced eight engine lathes formerly used on this job — and substantially increased production of sewing machine crankshafts at the same time.



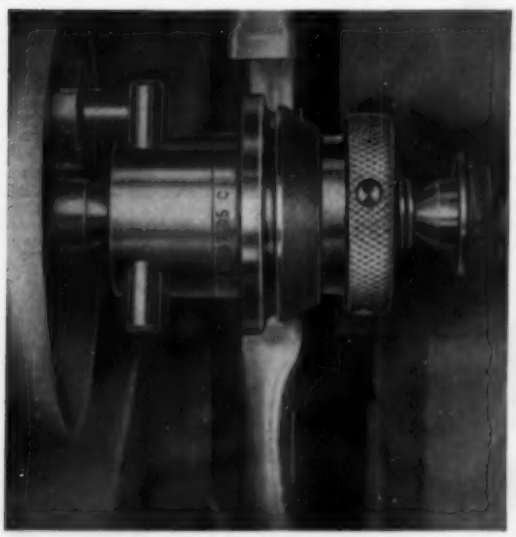
Universal Turret Lathes



Automatic Thread & Form Grinders



Fay Automatic Lathes



GRINDING. This J & L Model "E" Form Grinder, used in producing seaming rolls for the canning industry, completely eliminated a roughing operation, increased production by 100%.

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MACHINE J&L COMPANY

517 Clinton St., Springfield, Vt., U. S. A.

Universal Turret Lathes • Fay Automatic Lathes • Automatic Thread & Form Grinders
Optical Comparators • Automatic Opening Threading Dies & Chasers
Automatic Double-End Milling & Centering Machines

Send today for complete details on J & L's machines, methods and Procurement Plans. Simply fill in the coupon below, clip it to your letterhead *and mail. We'll do the rest.*

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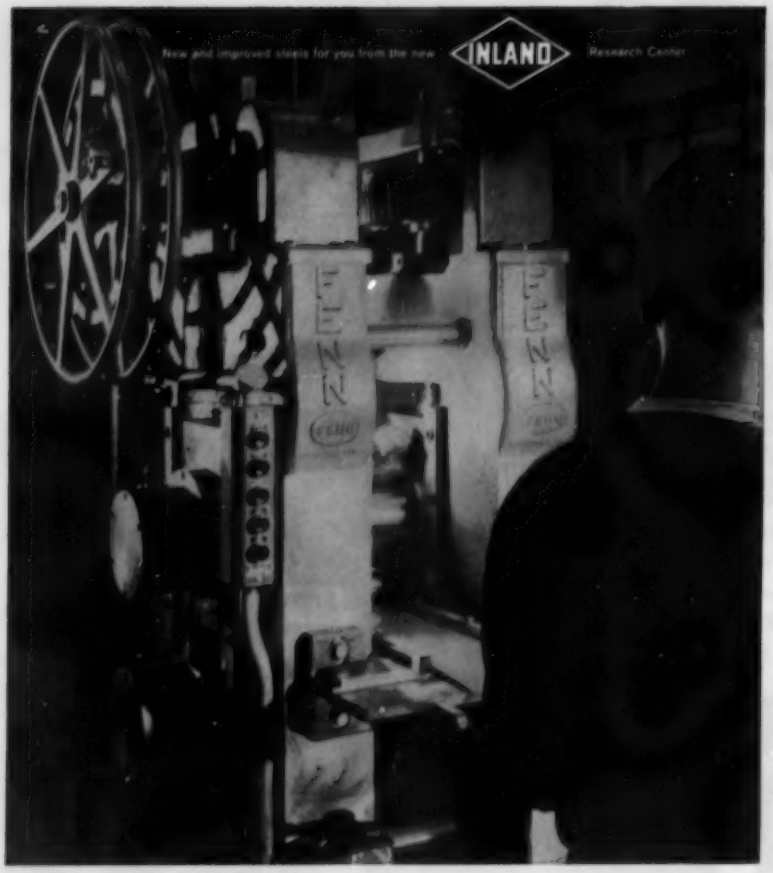
GENTLEMEN:
Please send me the J & L Machine Tool Replacement Information Kit.

Name.....

Title.....



THIS PINT-SIZE ROLLING MILL MAY SAVE YOU KING-SIZE HEADACHES (AND MONEY TOO!)

At Inland, 'new ideas' are considered as vital a raw material in steelmaking as top grade iron ore and coal. Establishing reserves of this basic ingredient is a continuing job for Inland's research and development people. The new Inland Research Center in Hammond, Indiana, where Inland researchers look for better steels and more efficient ways to make them, is the most recent addition to Inland's 'new idea' resources.

We at Fenn are pleased to quote the foregoing from a recent advertisement of Inland Steel Company of Chicago. We are especially glad that Inland found, in Fenn rolling mills, the precision, flexibility and rugged dependability demanded in their research projects.

Fenn will design rolling mills for all special applications, in a complete range of sizes, and will furnish all accessories. Fenn mills have extra bearing capacity to take higher horsepowers, and are designed for year-after-year accuracy —owning cost is exceptionally low.

FENN

PRECISION ROLLING MILLS—TURKS HEADS—WIRE SHAPING MILLS—SWAGING MACHINES—ACCESSORIES

The Fenn Manufacturing Company, 553 Fenn Road, Newington, Connecticut

LETTERS
TO THE EDITORS

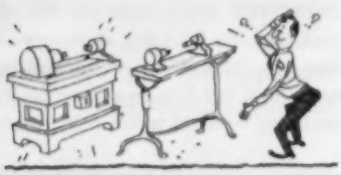
Filter Maker Sought

We are interested in the metal powder filters discussed in the item, "Selective Filters," in the Technical Outlook column of May 30 (page 69). Would you forward the name and address of the manufacturer?

Dr. Roger Gilmont
Technical Director
Emil Greiner Co.
New York

• *Either the Metals Disintegrating Co. Inc., 901 Lehigh Ave., Elizabeth, N. J., or the Micro Metallic Corp., 30 Sea Cliff Ave., Glen Cove, N. Y., can help you.*

Enlightening Study



I find your fifth Program for Management article, "When To Re-Equip" (June 20, page 99), enlightening. I would appreciate receiving a copy of this and the previous four articles.

We feel a greater number of the valuable ideas brought forth in these studies will be put to work if they are readily available in a reference file.

Please accept our thanks for the fine services you are rendering and our congratulations for a job well done.

Donald C. J. Gray
Factory Manager
Hastings Equity Bin Mfg. Co.
Hastings, Nebr.

This is the best presentation of the subject that has come to our attention.

Henry L. Ruf
Director of Purchases
Parkersburg-Aetna Corp.
Parkersburg, W. Va.

Your article was well done. I enjoyed reading it, not only because of the simplicity of the writing, but also because of the interesting aspects disclosed.

J. E. Brown
Treasurer
Cooper-Bessemer Corp.
Mount Vernon, O.

Salt Spray Postscript

We thought you might be interested in comments on the article, "Salt Spray Passes Acid Test" (May 9, page 92). Some of the sponsors of the acetic acid salt spray test feel it gives results that compare well with failures on cars in actual service. As far as we are concerned, this has not been determined.

The article states that the auto industry has been adding 1 per cent glacial acetic acid to a 20 per cent salt solution at 120° F for ten years to reproduce blistering. This has been true of only one company.

Your article refers to the fact that failures of parts exposed on the roof and

(Please turn to page 12)

How many push-ups in a STAINLESS TUBE?

Courtesy: American District Steam Co., Inc.

The service life of this corrugated element depends on its ability to do push-ups.

Hydraulically formed from a welded stainless steel tube, it's a vital part in a Corruflex pipe expansion joint. In operation it absorbs the motion that results from pipe expansion and contraction. Often used in inaccessible locations, it's produced to rigid standards to eliminate shutdowns . . . loss of manhours . . . and maintenance costs.

In a recent durability test (see photo) the joint was subjected to 22,000 push-ups . . . 22,000 complete cycles of extension and compression —without failing. Flexing was stopped only because requirements had been met. Trouble-free tubing for this grueling application is regularly furnished by Frasse — in stainless types 304, 316 and 347—in sizes from 4¼" O.D. up to 54¾" O.D. !

Frasse specializes in furnishing *quality* tubing for exacting applications — and stocks in conveniently located warehouses a complete range of sizes in carbon, alloy and stainless analyses for you to work with. And, equally important, Frasse engineers will gladly work with you in determining the right size and grade needed to do the job. When you need tubing or tubing guidance—*always call Frasse.*

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If you use tubing . . .

Send for this new folder describing *all* Frasse tubular products. Details include analyses, size ranges, mechanical and physical properties—also fabricating hints and ideas for end uses. Frasse tubing "specials" are included too! Mail the coupon for your copy—it's free!

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Desirable industrial sites, some with buildings, are available in mountain, piedmont and coastal areas, both urban and rural locations. For a copy of the North Carolina brochure, just write Ben E. Douglas, Director, Department of Conservation and Development, Raleigh 10, N.C.

Friendly North Carolina Where Industry Prospers

LETTERS

(Concluded from page 10)

on front bumpers of cars for one winter in Detroit match failures in the acid spray. Test results so far merely show trends (it is not a completely accepted test for chromium-plated automotive parts). The acid spray has many of the difficulties of the regular salt spray in obtaining reproducible results both within a specific unit and between units.

The automotive industry is working with the plating industry (through the American Electroplaters Society's Research Project 15 Committee) to develop a new set of suitable test standards. We hope to have something definite within the next year or so. The acid spray test is one of several being evaluated.

Until it has been determined that the acid spray test is suitable or that a better test can be developed, we will continue to use the ASTM salt spray test for quality acceptance of plated parts.

Carl O. Durbin
Corrosion Laboratory
Engineering Division
Chrysler Corp.
Detroit

Sticky Subject

Referring to your article, "They're Pulling for Better Bonds" (June 20, page 121), whom may we contact for further information on the brands of cement used and the results?

Frank Schwartz
Purchasing Agent
Astoriold Mfg. Co.
Brooklyn, N. Y.

• *Contact Dr. Leo Schapiro, supervisor, Materials Laboratory, Douglas Aircraft Co., Santa Monica, Calif.*

'New' Steel Fits Bill

Your article, "High-Strength Steels Gain Sales" (June 27, page 125), is most timely. It is well worth consideration by the manufacturing industry in designing and producing products for both defense and civilian use.

R. C. Archer
Vice President
International Harvester Co.
Chicago

Exploring the Market

We are interested in exploring the replacement market for fractional and integral horsepower motors on pumps and other hydraulic equipment. Do you have any data on this specific market?

Rodney R. Adler
Advertising Manager
Acme Electric Corp.
New York

• *We are sorry we do not have this information. One source might be the National Electrical Manufacturers Association, 155 E. 44th St., New York 17, N. Y.*

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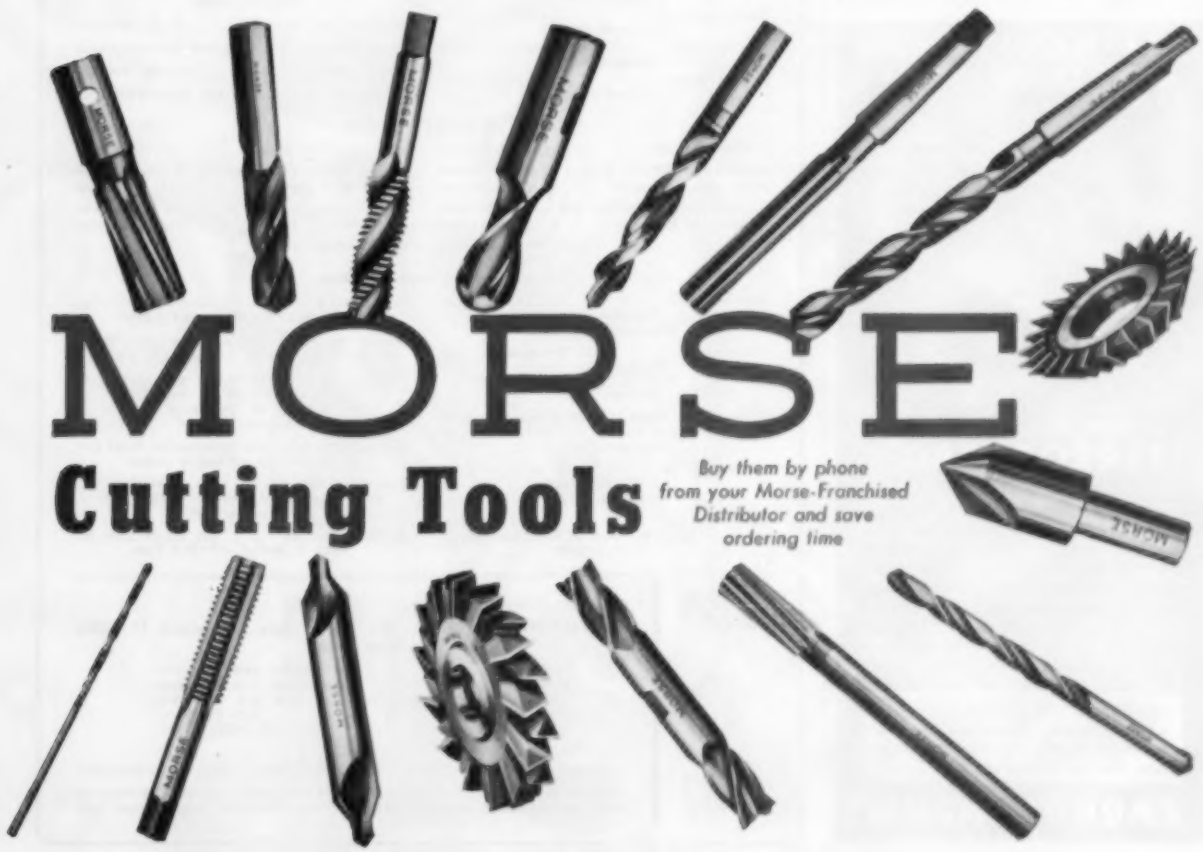

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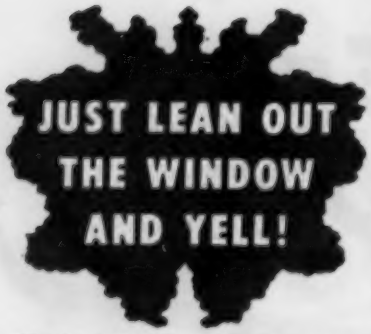

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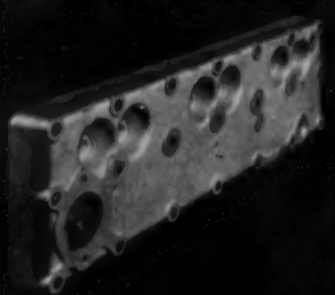

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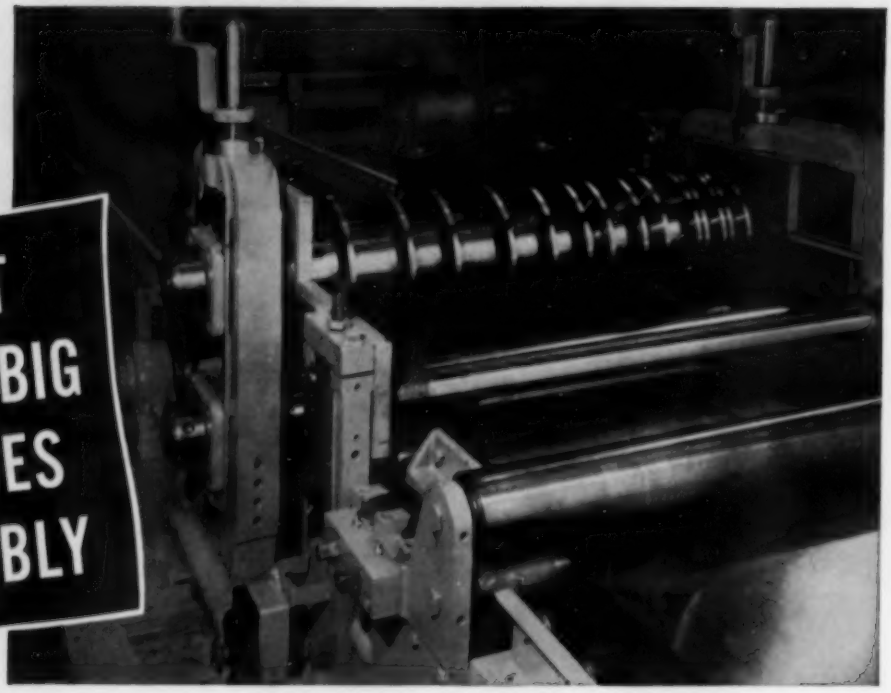

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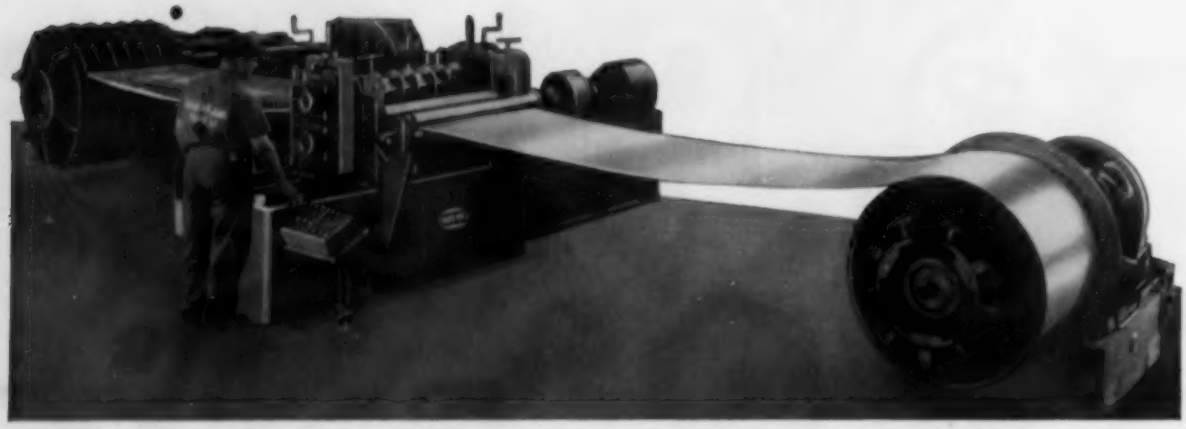

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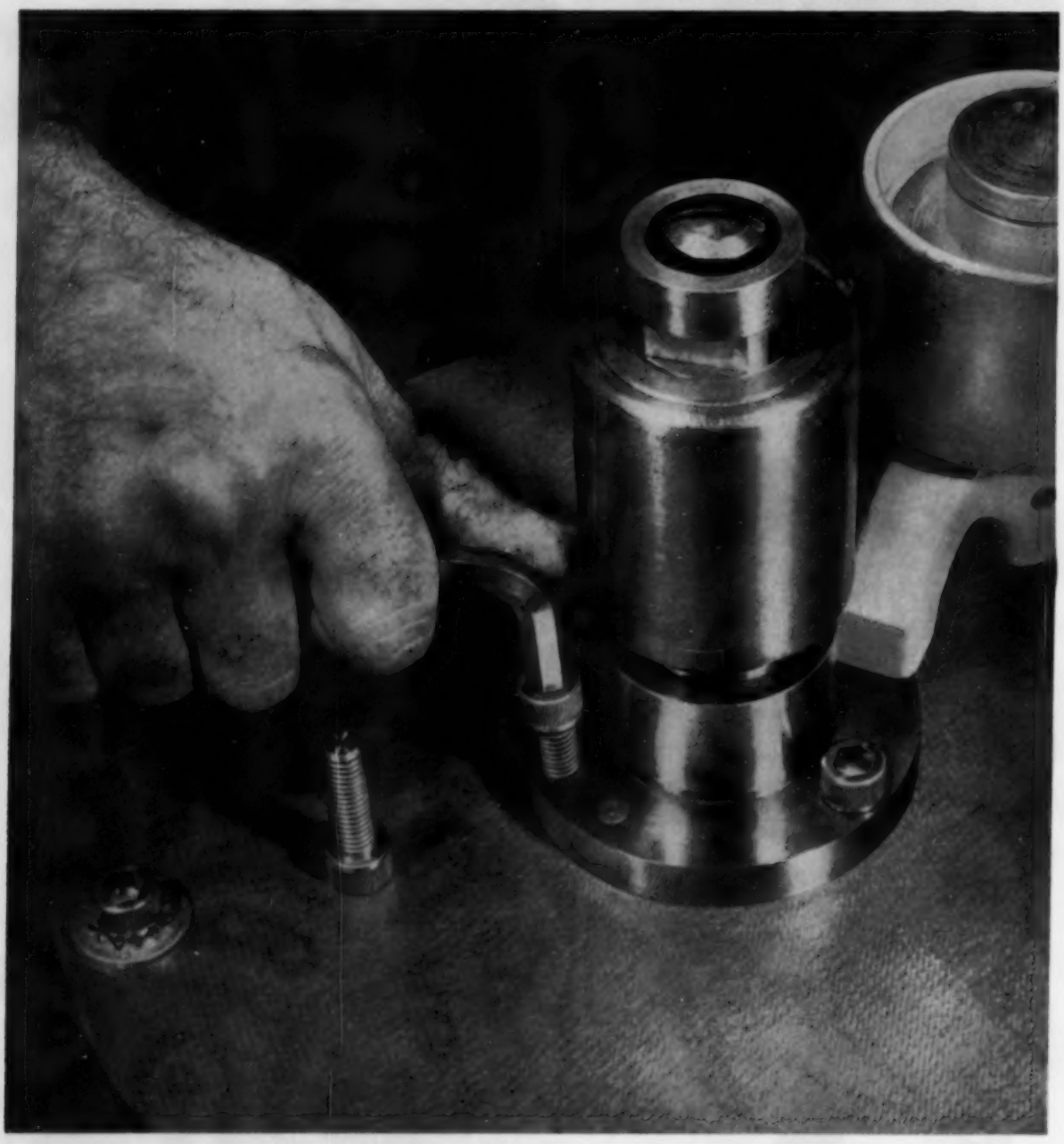

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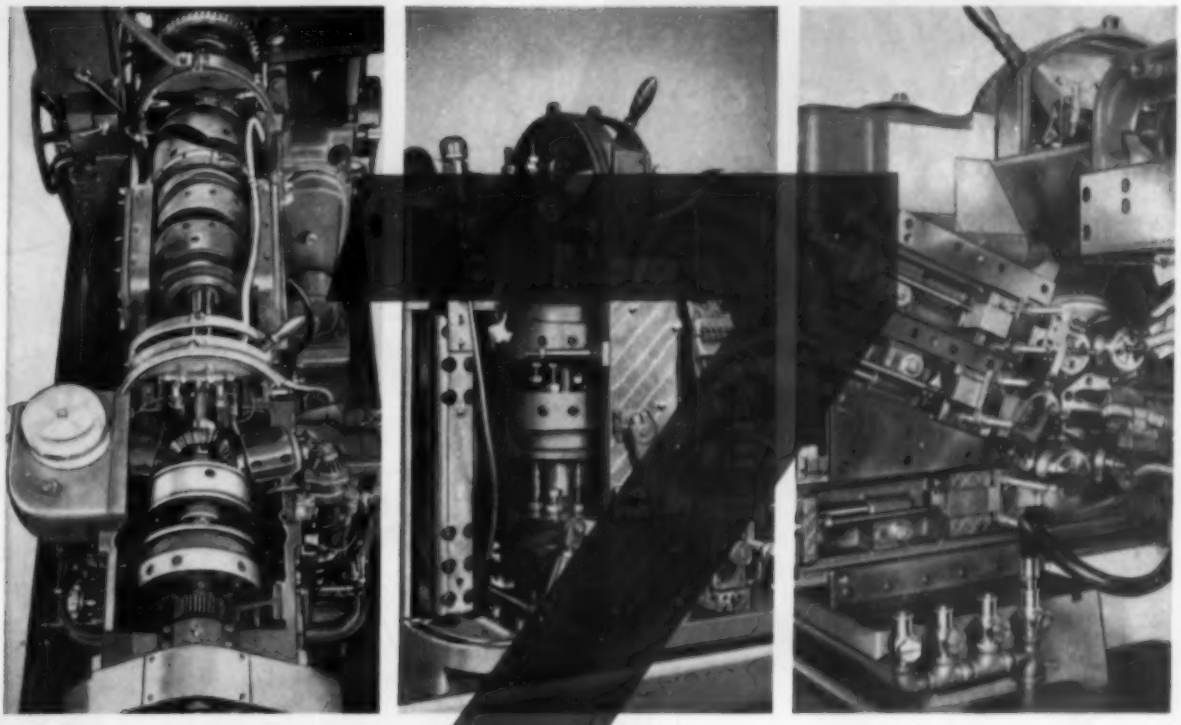

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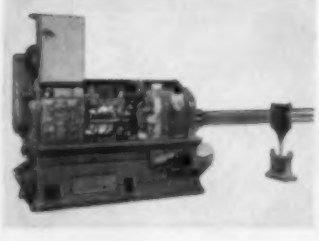

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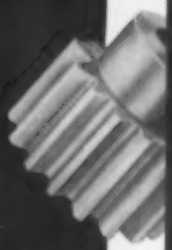

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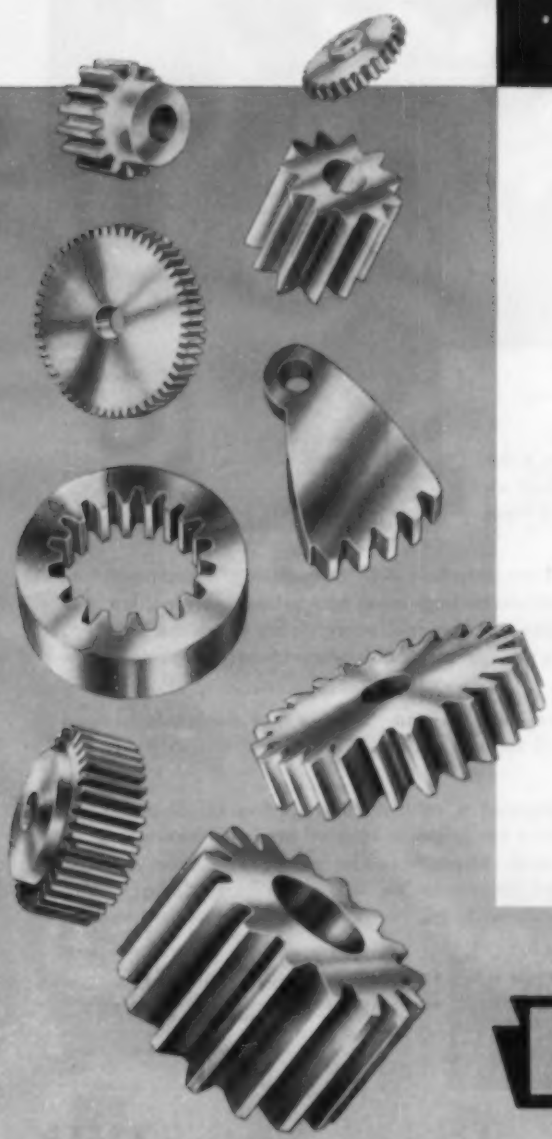

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Yield Point in Tension P.S.I. (0.2% Offset)		85,000
Elongation in 1 inch per cent		1.5
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Modulus of Rupture P.S.I.		195,000
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Write for informative Bulletin B-54, detailing composition and properties of popular Keystone powdered metal grades.

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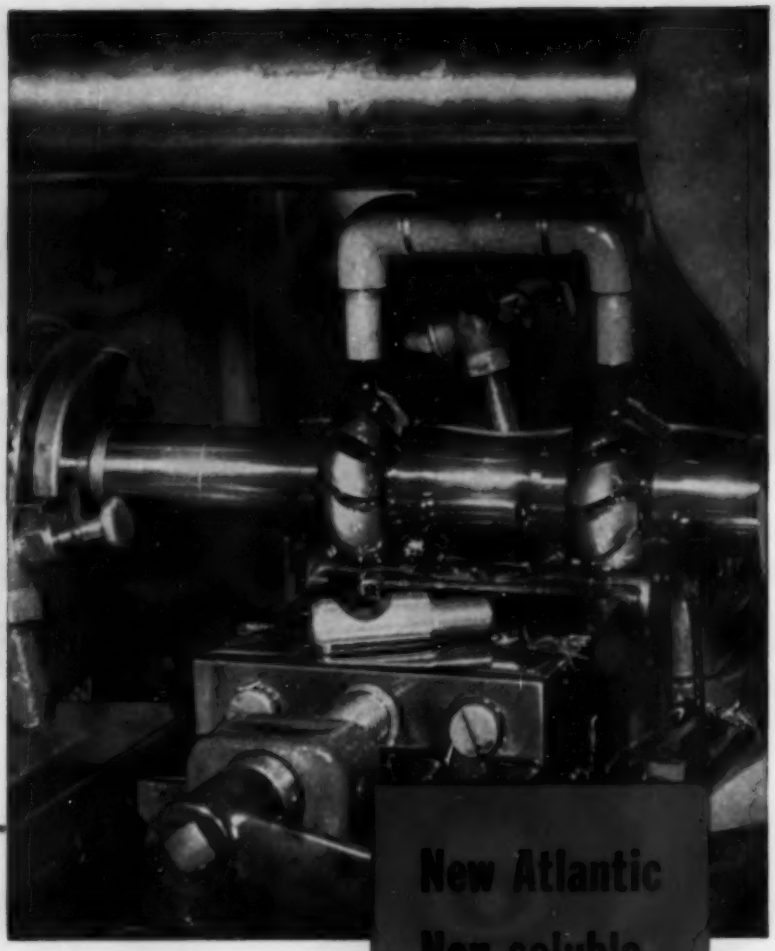

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CALENDAR
OF MEETINGS

July 12-14, Western Plant Maintenance Show: Pan-Pacific Auditorium, Los Angeles. Information: Clapp & Poliak Inc., 750 Monadnock Bldg., San Francisco 5, Calif.

July 21-23, Truck-Trailer Manufacturers Association Inc.: Summer meeting, Sheraton-Cadillac hotel, Detroit. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John B. Hulse.

Aug. 15-17, Society of Automotive Engineers Inc.: West coast meeting, Multnomah hotel, Portland, Oreg. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Aug. 22-23, Stanford Research Institute and National Industrial Conference Board: Symposium on electronics in automatic production, Sheraton-Palace hotel, San Francisco. Information: National Industrial Conference Board, 247 Park Ave., New York 17, N. Y. Secretary: Herbert Briggs.

Aug. 24-26, West Coast Electronic Manufacturers Association: Western electronic show and convention, Civic Auditorium, San Francisco. Information: WESCON, 344 N. LaBrea Ave., Los Angeles 36, Calif.

Aug. 28-Sept. 1, National Association of Furniture Manufacturers: Furniture supply fair, Conrad Hilton hotel, Chicago. Association's address: 666 Lake Shore Dr., Chicago 11, Ill. Secretary: John M. Snow.

Aug. 31-Sept. 26, World's Fair of Power: S. Lake Shore Dr. adjacent to Soldiers Field, Chicago. Sponsor: General Motors Corp.; General Motors Bldg., Detroit 2, Mich.

Sept. 5-6, American Machine Tool Distributors Association: Annual meeting and show, Blackstone hotel, Chicago. Association's address: 1900 Arch St., Philadelphia, Pa. Secretary: Thomas A. Ferniey Jr.

Sept. 6-8, Industrial Truck Association: Fall meeting, the Greenbrier, White Sulphur Springs, W. Va. Association's address: 526 Washington Loan & Trust Bldg., Washington 4, D. C. Managing director: William Van C. Brandt.

Sept. 6-8, Material Handling Institute Inc.: Fall meeting, the Greenbrier, White Sulphur Springs, W. Va. Institute's address: One Gateway Center, Pittsburgh 22, Pa. Managing director: R. Kennedy Hanson

Sept. 6-17, Metalworking Machinery & Equipment Exposition: Coliseum, Chicago. Information: Exhibition & Convention Management Inc., 2689 E. Overlook Rd., Cleveland 6, O. General Manager: C. L. Wells.

Sept. 6-17, National Machine Tool Show: International Amphitheatre, Chicago. Sponsor: National Machine Tool Builders Association, 2071 E. 102nd St., Cleveland 6, O. General Manager: Tell Berna.

Sept. 6-17, Production Engineering Show: Navy Pier, Chicago. Sponsor: National Machine Tool Builders' Association, 2071 E. 102nd St., Cleveland 6, O. General Manager: Tell Berna.

Sept. 9-11, Metal Powder Association: Fall closed meeting, the Homestead, Hot Springs, Va. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: Robert L. Ziegfeld.

Sept. 11-14, National Metal Trades Association: Eastern plant management conference, Essex and Sussex hotels, Spring Lake, N. J. Association's address: 122 S. Michigan Ave., Chicago 3, Ill. Secretary: Charles L. Blatchford.

Sept. 11-16, American Chemical Society: Fall meeting, University of Minnesota, Minneapolis. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 13-14, American Road Builders Association: Annual conference of county engineers and officials, New Riverside hotel, Gatlinburg, Tenn. Association's address: World Center Bldg., Washington 6, D. C. Secretary: Eugene Reybold.

Sept. 13-14, Allied Railway Supply Association: Annual meeting and exhibit, Sherman hotel, Chicago. Association's address: P.O. Box 5522, Chicago, Ill. Secretary: Charles F. Well.

Here are a few parts turned out on high-speed multiple-spindle automatic screw machines in quantity. Some are complete as they drop from the machine.

Others require additional finishing operations, like the largest piece, a special 10-32 collar screw with head formed and flattened on a punch press, *triple-lead* roll-threaded and then copper plated.

Your requirements may be for smaller or larger pieces. Western's capacity ranges from 1/16 to 4 7/8" round, with *all* necessary finishing equipment for such secondary operations as milling, drilling, threading, tapping, heat-treating and grinding.

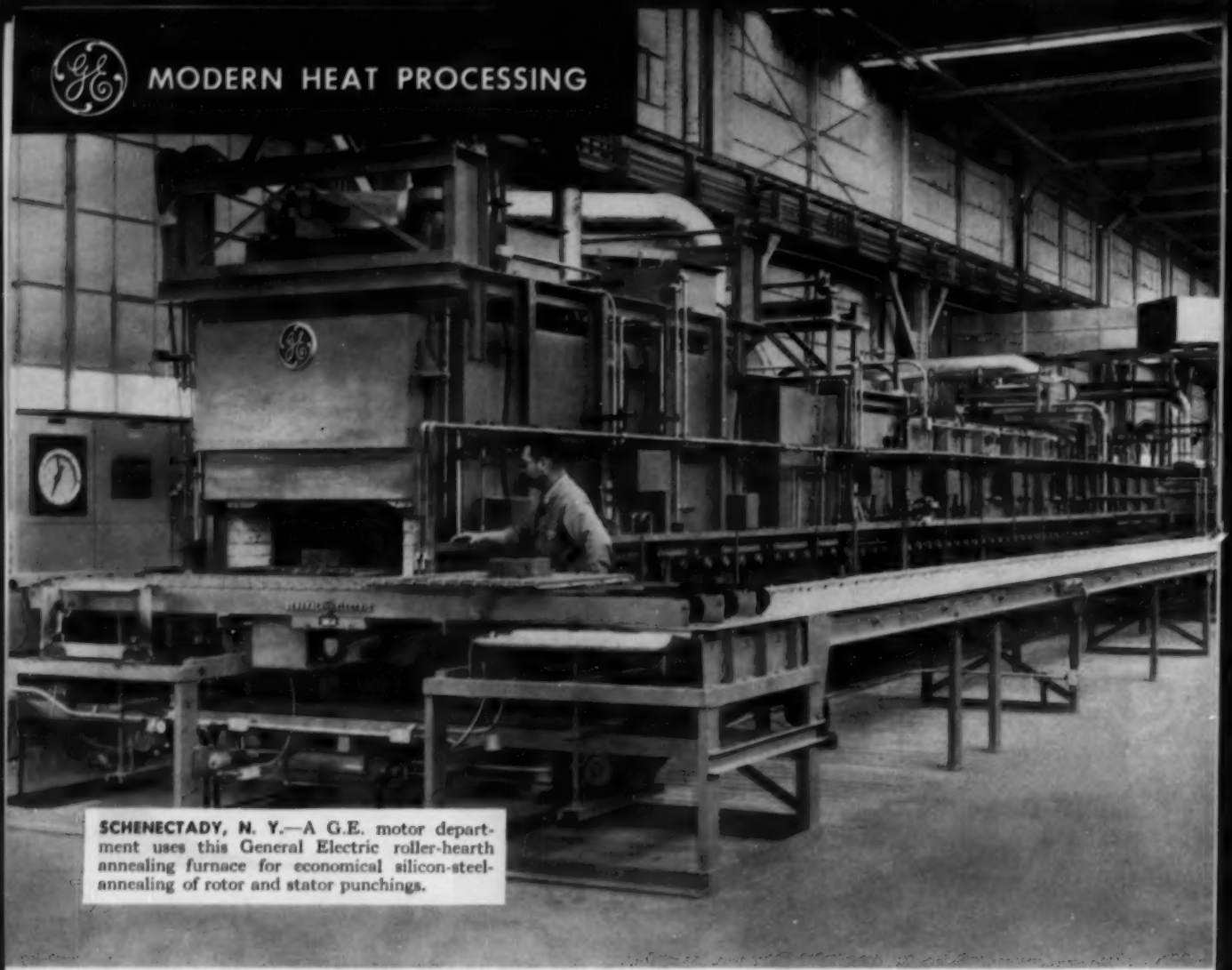
For fast, reliable delivery, precision quality and low cost, it pays you to put WESTERN on your production team.

Why not send us your blueprints for quotations...today?

Western Automatic
Machine Screw Company
377 Woodland Ave., Elyria, O.

Precision Screw Products, Parts and Assemblies Since 1873

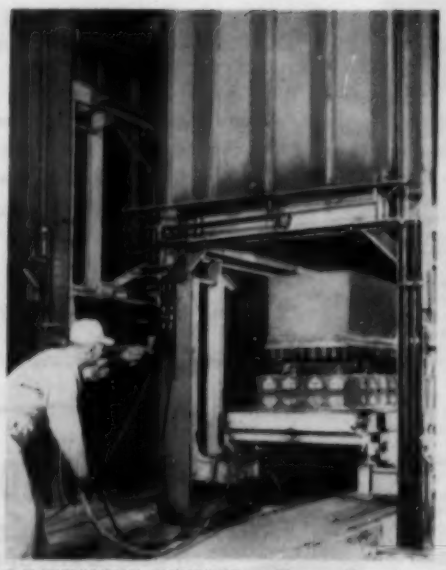
MODERN HEAT PROCESSING



SCHENECTADY, N. Y.—A G.E. motor department uses this General Electric roller-hearth annealing furnace for economical silicon-steel-annealing of rotor and stator punchings.

WIDE VARIETY OF G-E ANNEALING FURNACES NOW LETS YOU ANNEAL SILICON STEEL RIGHT IN YOUR OWN PLANT

Take a tip from General Electric, user of about 25% of the country's production of silicon steel—you can cut costs by annealing your own silicon steel. There's a General Electric silicon steel annealing furnace for nearly every type of annealing application—large or small. For example, the furnaces at right are located in different G.E. plants, each handling a different size silicon-steel-annealing job — *economically.*



G-E ELEVATOR FURNACE at Rome, Ga. plant is used for high temperature annealing of transformer cores—furnace fits in minimum space.

G-E BELL FURNACE, Waynesboro, Va. Low-production unit anneals machine parts at low cost.

PROBLEM:

Annealing silicon steel in an automated setup

SOLUTION:

G-E roller hearth furnace anneals stator punchings and weld in one pass, cuts costs

A General Electric roller hearth furnace in the new automated production line for one of G.E.'s motor departments anneals 1500 pounds of rotor and stator punchings an hour—helps produce a Tri-Clad® 55 motor every 2½ minutes. The stator punchings and weld are annealed at the same time. This eliminates the cost and time involved in making two passes through the furnace. Only one man is needed to oversee the complete annealing operation.

IN ADDITION TO G-E furnace quality, here are the advantages you receive when you deal with G.E. on silicon steel annealing:

(1) TECHNICAL KNOWLEDGE—G-E research helped pioneer the development of silicon steel for improved magnetic properties.

(2) EXPERIENCED USER—G.E. uses about 25% of the total production of silicon steel.

(3) EXPERIENCED BUILDER—G.E. offers a complete line of furnace and control equipment for your silicon steel annealing.

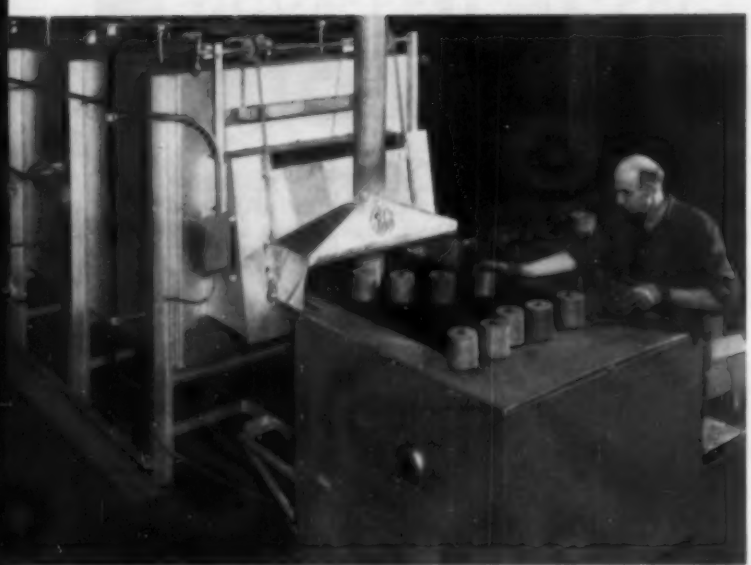
(4) APPLICATION HELP—plus installation supervision—assure you of the most efficient furnace installation.

(5) MAINTENANCE SERVICE—Nearly 200 G-E service shops, located throughout the country, are ready to help you 24 hours a day.

ASK FOR THE SERVICES of your local G-E Apparatus Sales Representative in assessing the economies of annealing silicon steel in your plant. Just call your nearby General Electric Apparatus Sales Office.

®Reg. trademark of General Electric Company.

GENERAL ELECTRIC



G-E MESH-BELT FURNACE located at Ft. Wayne, Ind. plant blue-anneals rotor laminations. Ideal for medium production, the mesh-belt furnace is flexible for use over a wide range of temperatures and speed.

FREE PROCESS BULLETINS

Please send me the Modern Heat Processing bulletins I have checked below.

- ☐ Protective Atmospheres, GEA-5907
- ☐ Annealing Malleable Iron, GEA-5797
- ☐ Furnace and Induction Brazing, GEA-5889
- ☐ Wire Enameling, GEA-6179
- ☐ Heat-treating Aluminum, GEA-5912
- ☐ Forging with Induction Heat, GEA-5983

General Electric Company
Apparatus Sales Division, Section 9721-4
Schenectady 5, New York

Name .....

Position .....

Company .....

City ..... State .....

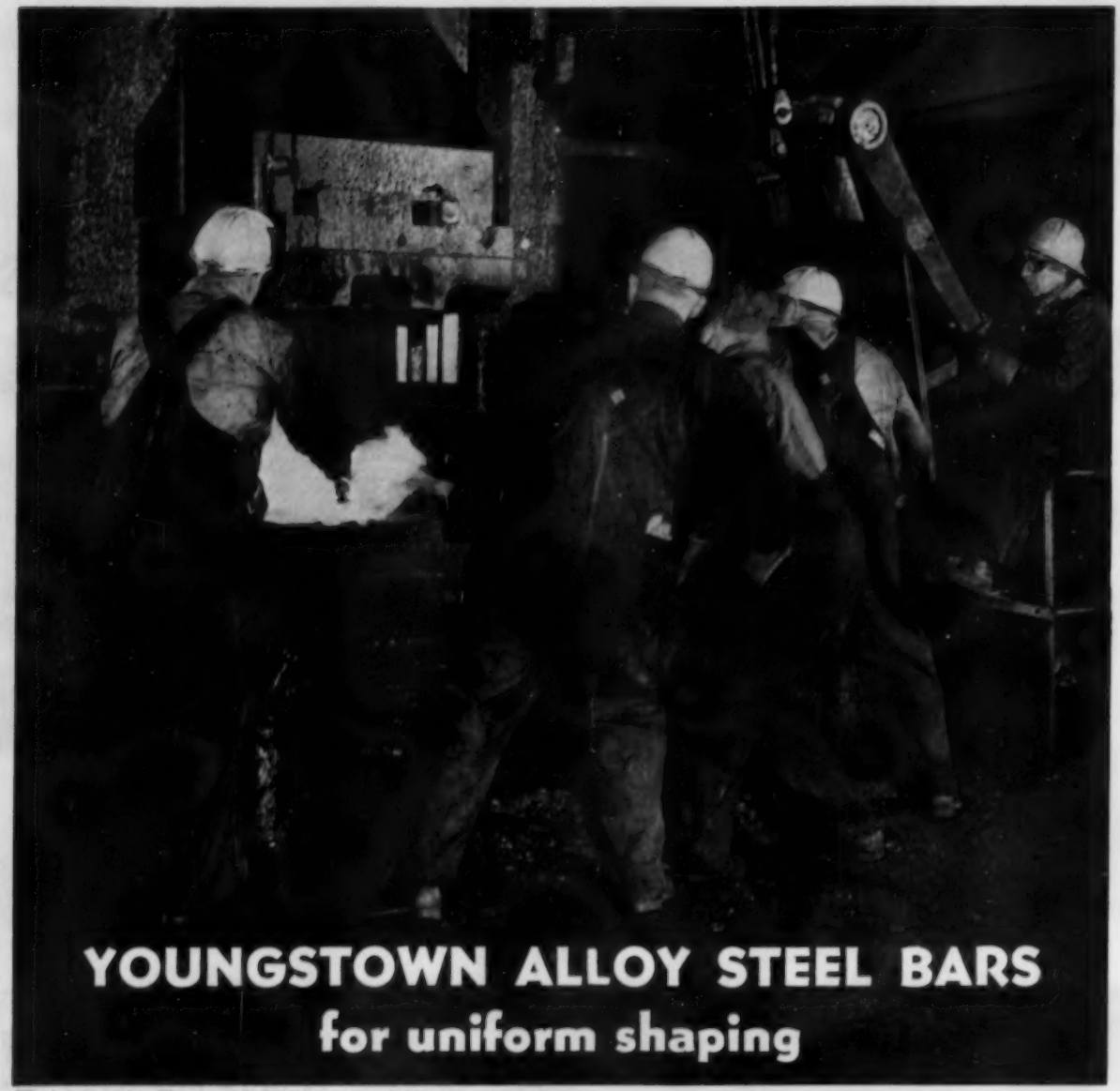


Photo courtesy Transue & Williams Steel Forging Corp.

SPECIFY

Youngstown

Hot Rolled Alloy Bars

QUALITY YOUNGSTOWN SERVICE

●Quality control of Youngstown Hot Rolled Alloy Bars insures uniform chemical composition and mechanical properties, as well as uniformity of dimensions. These desirable characteristics result in minimum forging rejects and less loss in flashings.

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Stambaugh Building - - Youngstown 1, Ohio
Plants: Youngstown, Ohio; Struthers, Ohio; Indiana Harbor, Indiana

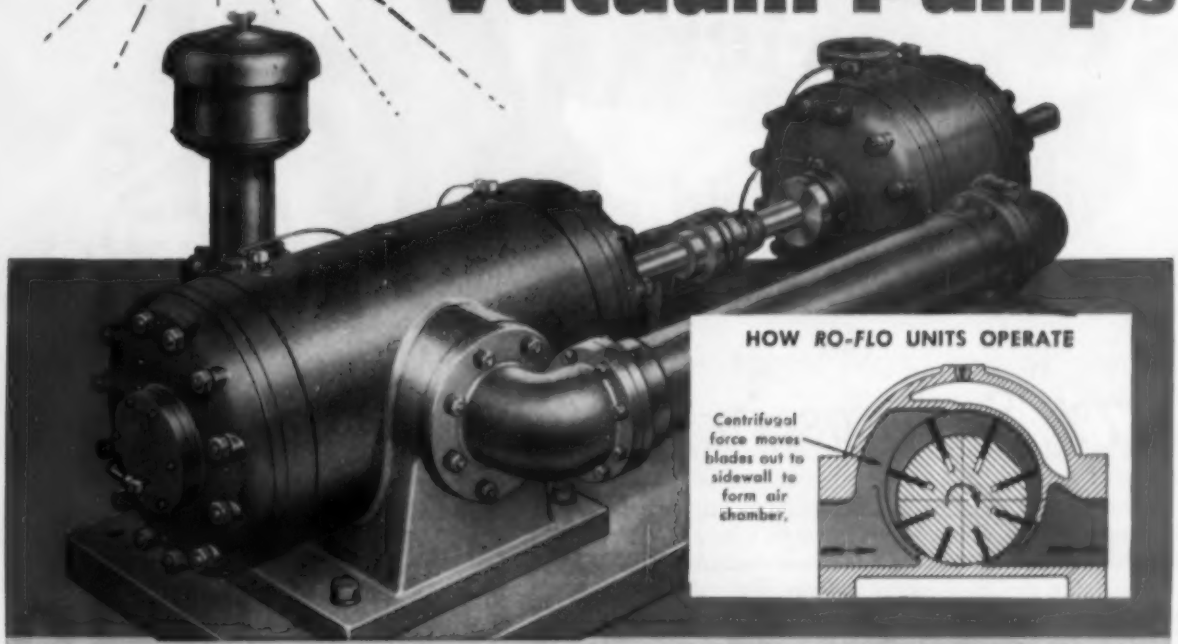
SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

ALLIS-CHALMERS

NEW

100-lb Compressors

0.3-in. Mercury Absolute Vacuum Pumps



FOR SHOP AIR • DRILLING • GAS HANDLING • VACUUM PUMPING

Now—the *Ro-Flo* line is extended to include high pressure as well as low pressure units to give you three important advantages:

Constant efficiency —Automatic compensation for wear is inherent in *Ro-Flo* design. During operation, rotor blades slide against the sidewall to form air cells. Any blade wear from this action is compensated for by the rotating force which holds blades in contact with the cylinder.

Simple foundation requirements—The smooth rotation of the *Ro-Flo* unit cuts vibration and eliminates need for heavy, expensive foundations.

Low maintenance —Shock and vibration, inherent in reciprocating machines, is eliminated. This cuts maintenance.

Two-stage *Ro-Flo* compressors can be furnished in any of 12 sizes to handle from approximately 250 to 1800 cfm at pressures from 65 to 125 pounds gauge. Vacuum pumps furnished from 200 to 5040 cfm at 29.7 inches Hg vacuum, with shut-off of 29.9 inches Hg, referred, or better. Single-stage units are built for pressures up to 50 pounds gauge, 65 pounds absolute. Single-stage pumps for vacuums up to 28 inches Hg referred.

A-4569

GET INFORMATION

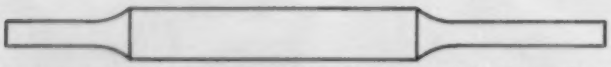
Call your nearby A-C district office, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

Ro-Flo is an Allis-Chalmers trademark.

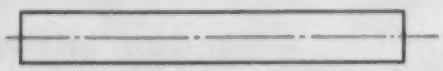
ALLIS-CHALMERS

Swaging Success Stories

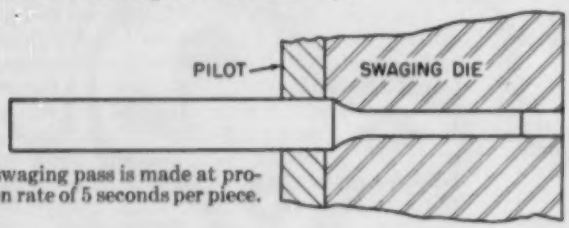
37% Savings in Material . . . by swaging



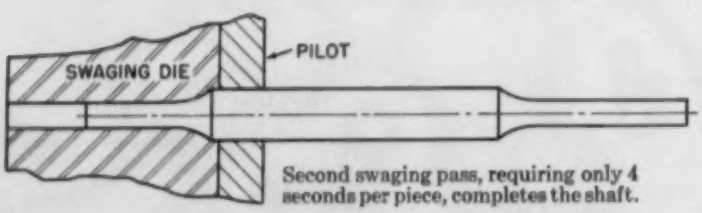
Here's a steel shaft (shown half-size) that was originally produced by turning. A switch to swaging resulted in a 37% material saving.



This is the blank for swaging. Blank for turning was same diameter—but the full length of the finished piece.



First swaging pass is made at production rate of 5 seconds per piece.



Second swaging pass, requiring only 4 seconds per piece, completes the shaft.

Check these advantages of swaging

substantial savings in material
high burnished finish
close tolerances—accurate to ±.001
savings in labor—through higher production rate and use of unskilled labor

Write for our informative booklet on swaging. It contains detailed descriptions of the Torrington Rotary Swagers. You may find that swaging offers important advantages over your present fabrication methods.

THE TORRINGTON COMPANY
Swager Department
150 North Street, Torrington, Conn.
Makers of Torrington Needle Bearings

TORRINGTON ROTARY SWAGING MACHINES

dependable!

WEIRTON

high carbon strip
cold-rolled spring steel

for high-speed blanking or forming

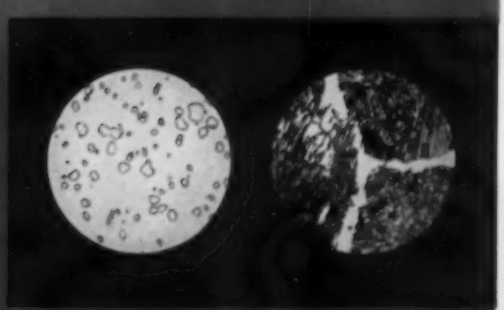
Where high fatigue-resistance is a principal factor, Weirton cold-rolled spring steel furnishes high carbon strip in the consistent uniformity necessary to meet the most exacting requirements of a wide variety of products. The close manufacturing control featured at Weirton results in several unique and highly desirable qualities—such as accurate response to heat treatment . . . uniformity of gauge and width . . . uniform chemical and physical properties . . . exact consistency of grain structure . . . controlled decarburization limits.

Pearlitic and spheroidized structures are available with desired chemical analyses and for specific heat treating and hardness. When you call Weirton you call for easier blanking and cold forming. And, at Weirton, you get what you call for.

WEIRTON STEEL COMPANY

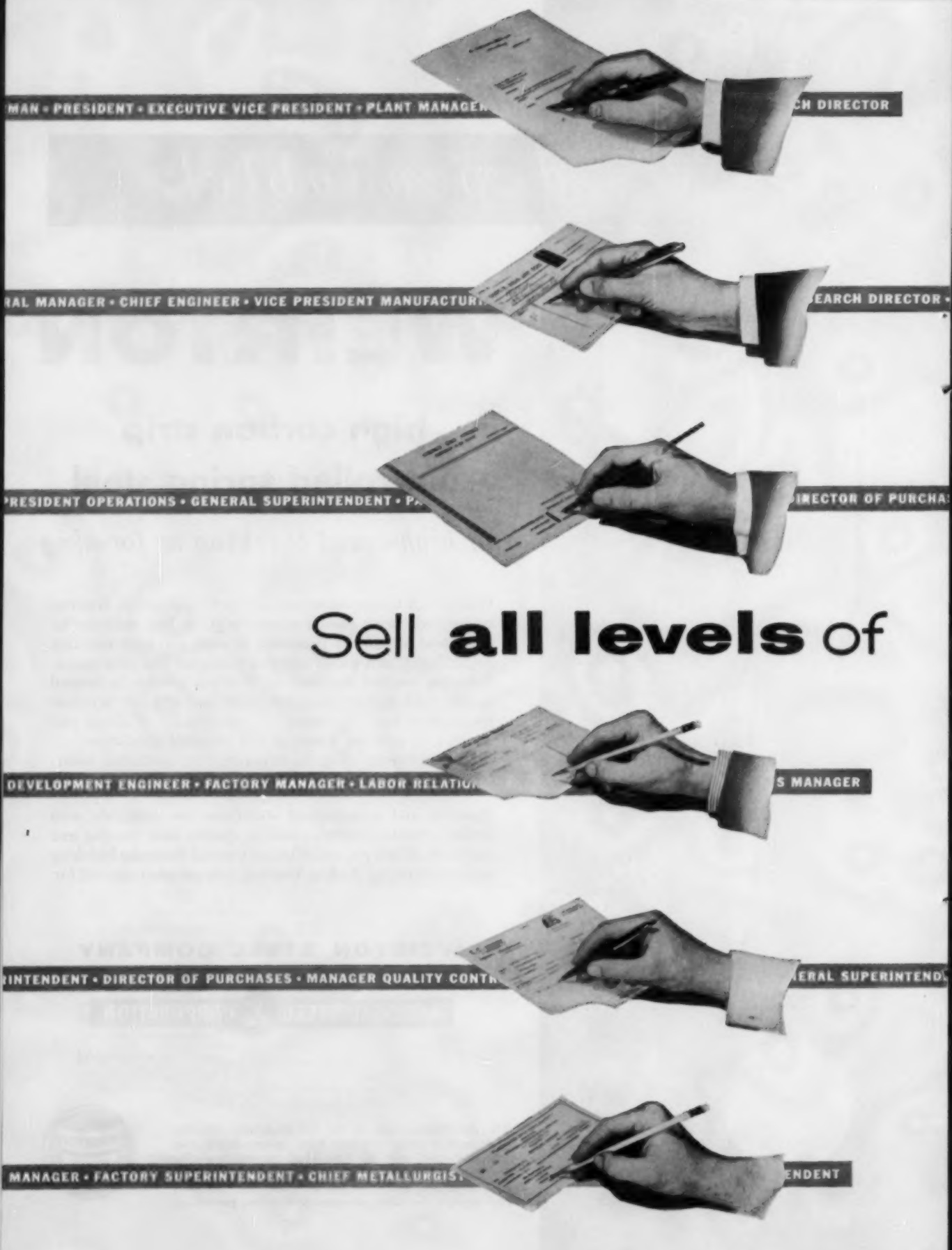
Weirton, West Virginia

NATIONAL STEEL CORPORATION



The photomicrograph on the left illustrates Weirton high carbon strip that has been spheroidized and annealed—soft and ductile—ideal for cold-forming operations. The one on the right shows the pearlitic steel structure, temper-rolled in controlled hardness and strength for clean, economical blanking procedure.

WEIRTON STEEL COMPANY


MAN • PRESIDENT • EXECUTIVE VICE PRESIDENT • PLANT MANAGER
CH DIRECTOR
RAL MANAGER • CHIEF ENGINEER • VICE PRESIDENT MANUFACTURI
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PRESIDENT OPERATIONS • GENERAL SUPERINTENDENT • PA
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MANAGER • FACTORY SUPERINTENDENT • CHIEF METALLURGIS
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metalworking management...

Build the strength of STEEL

into your advertising program

You want the best communications you can get with the world's biggest industry. No sales organization can cope with this job alone. It's too big.

Your advertising in STEEL talks to the decision-makers at *all levels!* . . . the administrative, production, engineering and purchasing executives—in the plants that do *over 96% of all metalworking business.*

These men read STEEL regularly. Its fast, modern reporting style is in tune with their requirements. No other metalworking magazine can deliver so many worthwhile readers —138,000 of them—every week. Here is a real opportunity to sell management at every level!

Look at a copy of STEEL and you'll see why, in 1954, advertisers invested more dollars in STEEL than in any other metalworking publication!

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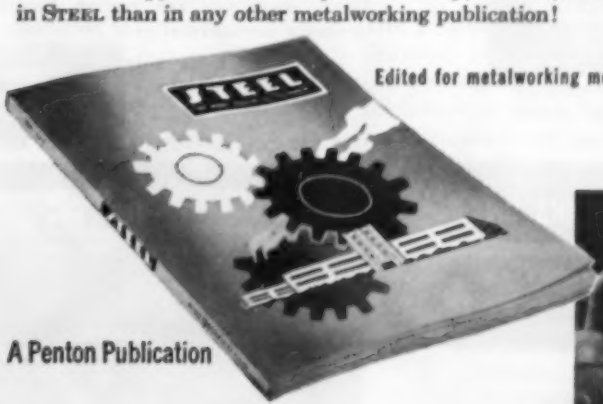
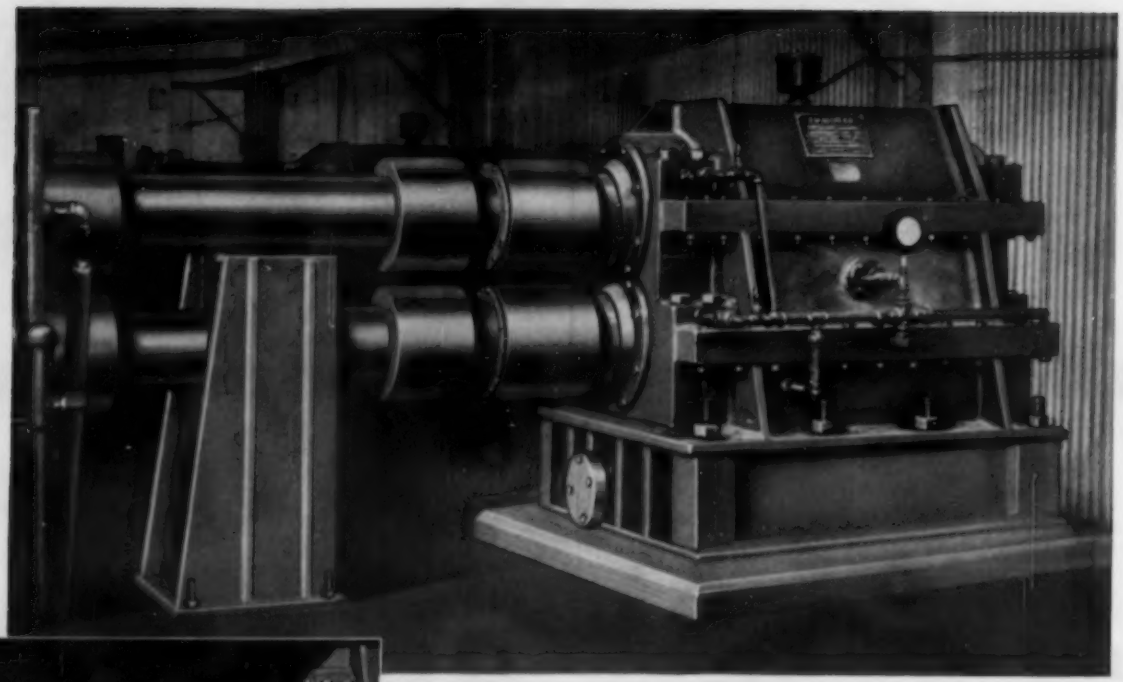
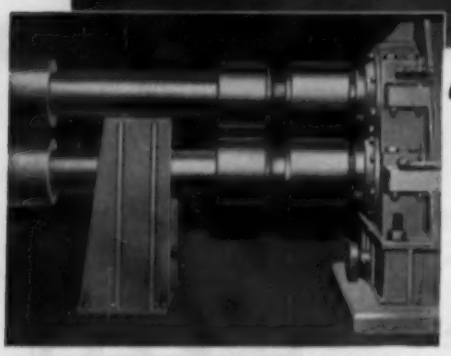


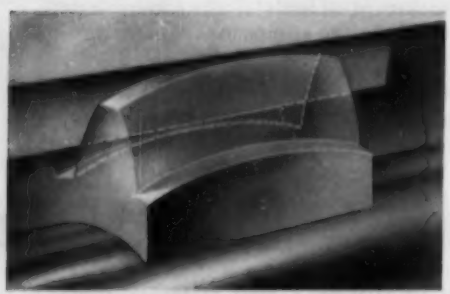
Edited for metalworking men at every management level . . .

A Penton Publication





Four stand tandem cold reduction mill built by E. W. Bliss Company, of Salem, Ohio. Equipped with eight "Sphereflex" roll shaft couplings, two couplings per stand, each coupling rated 750 HP at 50 RPM.



Cut above shows curved root and spherical tooth flank, which will compensate for any and all types of misalignment.

"SPHEREFLEX" ROLL DRIVE COUPLINGS

The E. W. Bliss Company, Salem, Ohio, chose the "Sphereflex" spindle roll coupling in its design of a 4-Hi mill. Designed for 6° angularity the couplings above offer higher efficiency, lower replacement cost and reduced maintenance than old style couplings.

EXCLUSIVE "SPHEREFLEX" TOOTH DESIGN PERMITS MAXIMUM ANGULAR CAPACITY WITH MINIMUM BACKLASH — PERMITS CONSTANT LINEAR ROLL SPEED WITH IMPROVED OPERATING EFFICIENCY.

The Sphereflex tooth, incorporating a curved pitchplane having a constant chordal thickness, results in a modified ball and socket joint so necessary for high operating efficiency of rotating equipment.

For industrial applications, there is a complete range of standard gear couplings utilizing the new "Sphereflex" tooth form. These standard "Sphereflex" couplings are priced competitively with ordinary commercial gear couplings.

Let Phillie Gear help you design greater efficiency and life into your industrial equipment.

SEND FOR "SPHEREFLEX" CATALOG C-540, AND BE CONVINCED.

PHILADELPHIA GEAR WORKS, INC.

ERIE AVE. & G ST., PHILADELPHIA 34, PA.
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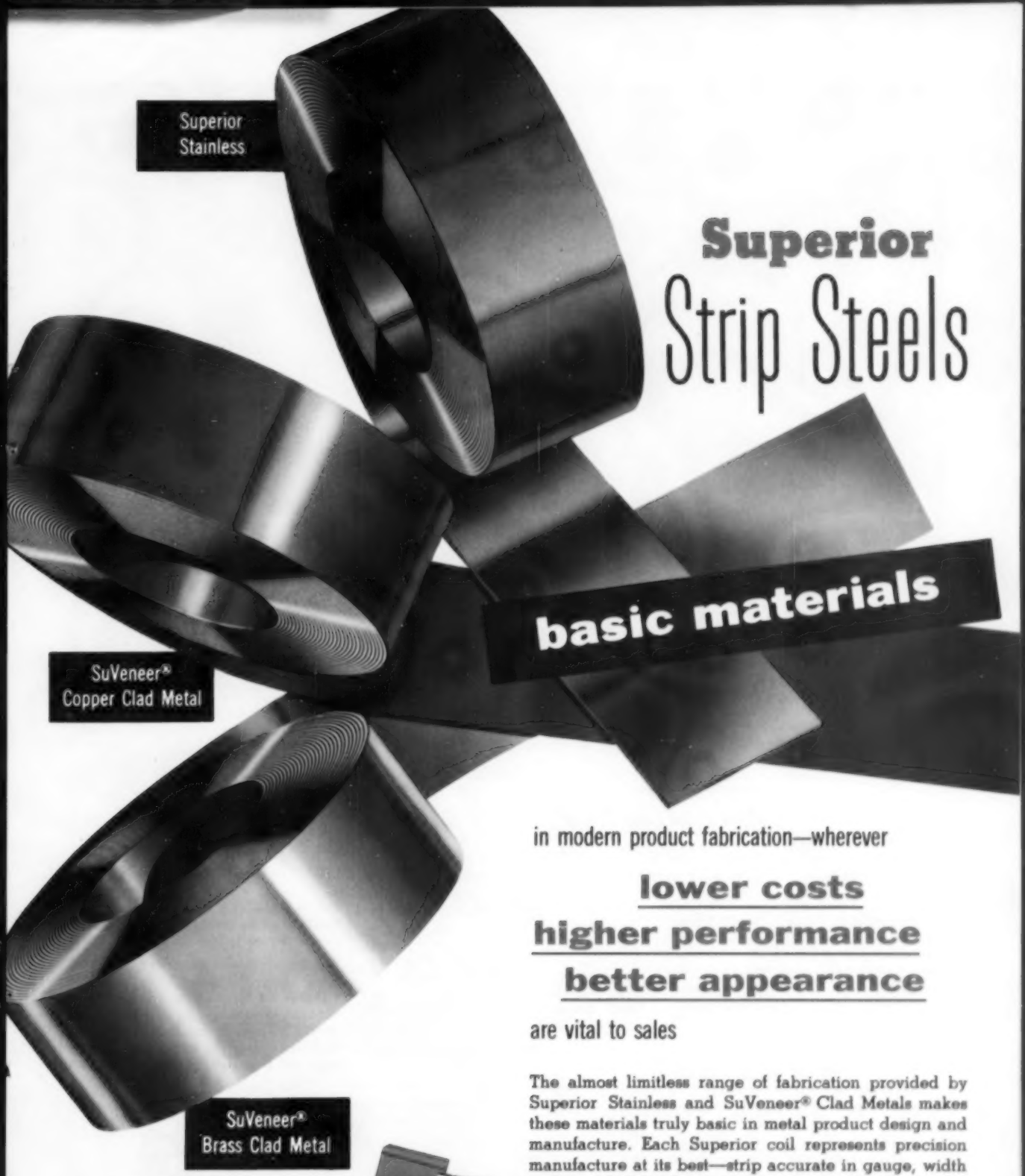
Industrial Gears & Speed Reducers

LimiTorque Valve Controls

Established 1892



Superior Strip Steels

basic materials

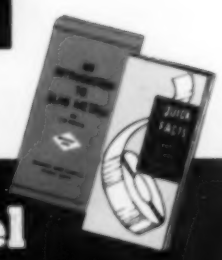
in modern product fabrication—wherever

lower costs
higher performance
better appearance

are vital to sales

The almost limitless range of fabrication provided by Superior Stainless and SuVeneer® Clad Metals makes these materials truly basic in metal product design and manufacture. Each Superior coil represents precision manufacture at its best—strip accurate in gauge, width and specified finish—uniform in composition—exact in temper for your particular need. *Check with us!*

"QUICK FACTS on Superior Strip Steels" . . . and "An Introduction to Clad Metals" . . . two useful, free publications you should have. Write for them today!



Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

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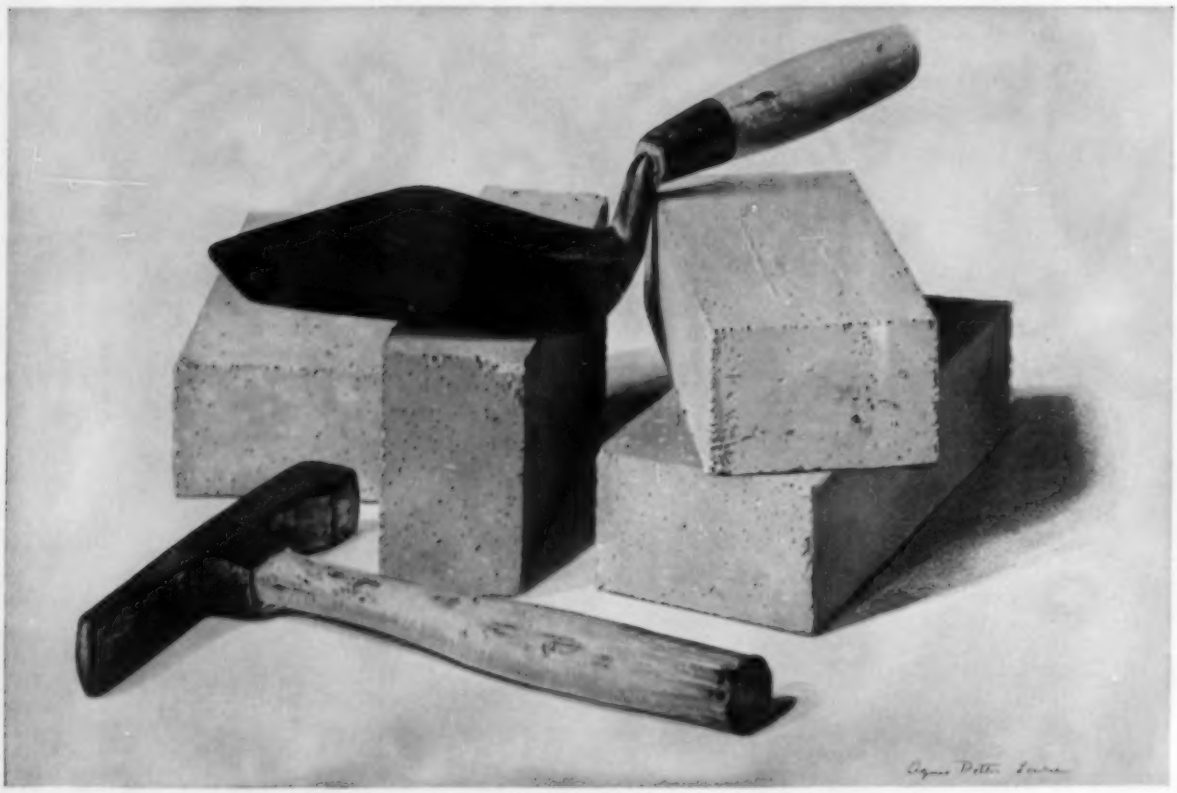
Hot Rolled and Cold Rolled Strip Steels

- Stainless of all Analyses
- SuVeneer® Clad Metals
- Alloys, Spring Steels and Specialties



"Lining for the Furnaces" by Agnes Potter Lowrie, famed artist daughter of a noted steelmaker. In this second of a specially commissioned series, Mrs. Lowrie captures the deceptively soft, seldom seen texture of refractory brick so rugged it can withstand months of searing 3000° temperatures.

The Fine Art of Steel Making

Whether it's building bridges or bombers, skyscrapers or pipelines . . . when America grows, it calls on steel. Year after year the industry has met the demand for more steel, better steel, faster and more efficient production. Today's speedy, almost automatic four-high mill, for instance, rolls in a single 8-hour shift more steel than the old-time hand mill produced in a week.

As the mechanics of steel making improved, so have the materials which smooth the process — Ironsides roll neck and roller bearing lubricants.

Roll neck shield, once applied by hand, is now supplied in liquid and semi-liquid form for continuous application by automatic pressure systems. Roll necks may be kept at constant temperature; the roller need not adjust his mill to maintain proper gauge.

More important, roll neck shield is formulated to the special needs of the individual user. For example, to compensate for local water and temperature conditions or to meet personal preferences of mill superintendents.

Roller bearing shield, an extreme pressure lubricant, has load-carrying capacity in excess of bearing manufacturers' standards, assuring a safety factor for peak loads. It carries the approval of all top bearing makers.

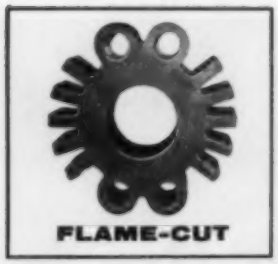
Today almost every major steel producer is a user of Ironsides lubricants. Our unique position in the industry is due to our ability to formulate for individual applications and supply those special formulas in any quantity.

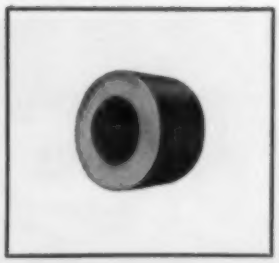
We like tough problems; we've solved a lot of them. For example, Palmoshield, replacement for palm oil and most significant advance in lubrication since World War II. If you have a problem, we'd like to help lick it. A letter will summon one of our engineers. Address The Ironsides Co., Columbus 16, Ohio.

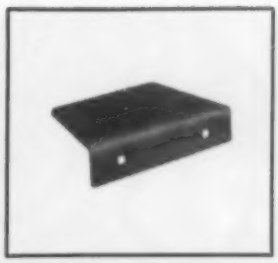
SHIELD PRODUCTS

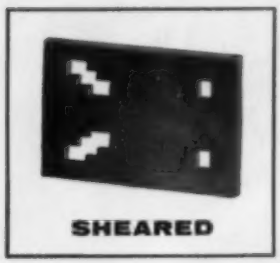
Ironsides

By the makers of Palmoshield • "the palm tree that grows in Ohio"

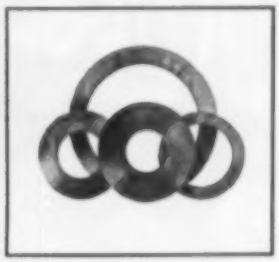


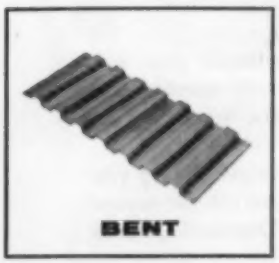






HOW MUCH WOULD YOU SAVE WITH PRE-FORMED PARTS?





STEEL PLATE SHAPES SERVICE CAN HELP CUT COMPONENT COSTS 5% TO 25%

You can slash production costs 5% to 25% . . . and get greater versatility and design freedom . . . with parts pre-formed from rolled carbon, alloy or clad steel plate.

Using By-Products Steel Co.'s Steel Plate Shapes Service, you get close tolerances that permit quick and easy incorporation into assemblies, often without further finishing. Men and machines can be freed for other work, and reduced fit-up time and the elimination of production steps speeds operations.

Reduced freight and handling charges and less need for costly plate inventories are additional benefits of this service. Over 150 major machines and an extensive standard die stock are available. Work can be done directly from blueprints in the finish you specify: as formed, rough- or finish-machined.

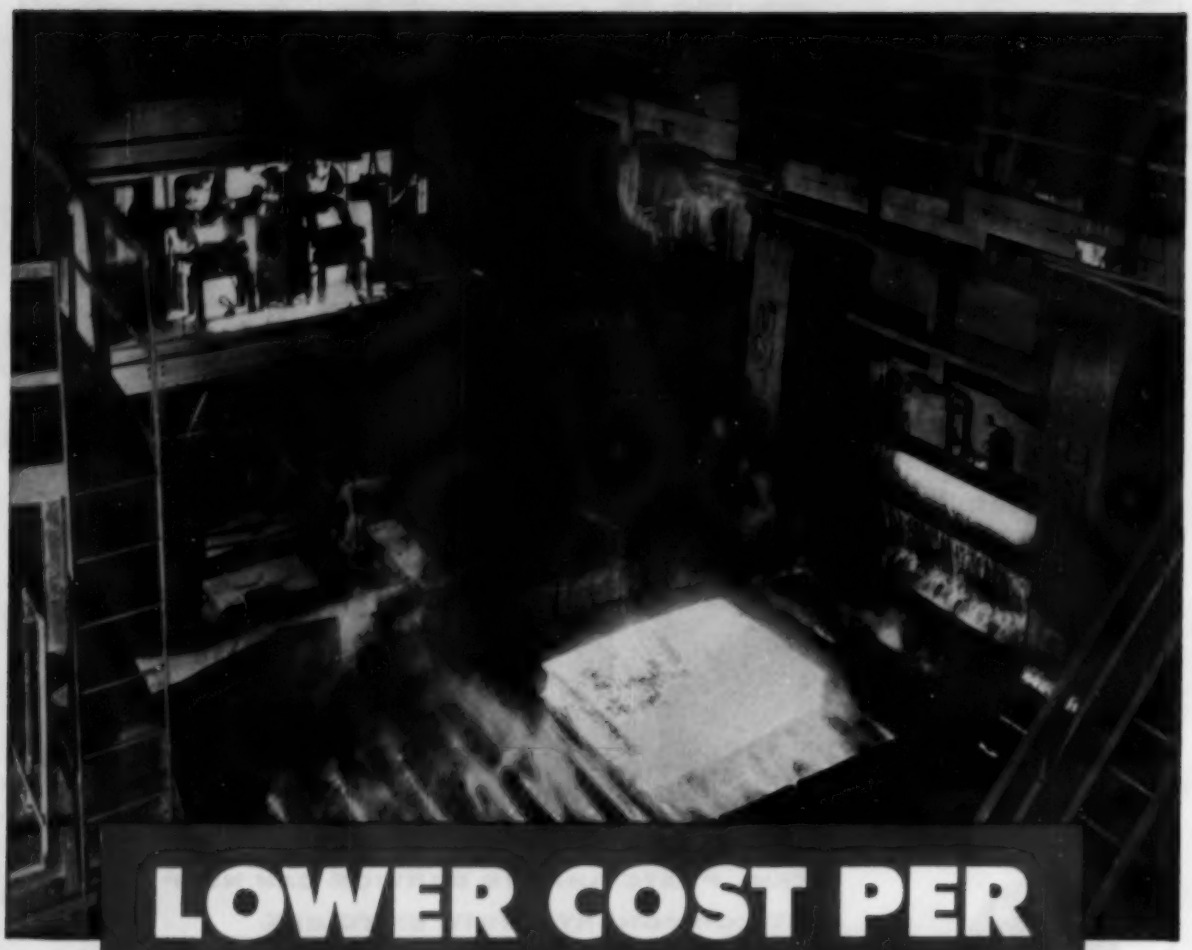
Your parts can be formed from plates up to 195" wide or 25" thick. Our location adjacent to the facilities of the world's leading producer of specialty steel plate assures flexibility in forming and heat treating to your specifications. For additional information on how you can put this Service to work, write on your letterhead for Bulletin 712. Address: By-Products Steel Co., 742 Strode Avenue, Coatesville, Pennsylvania.

LUKENS

STEEL PLATE SHAPES SERVICE

BY-PRODUCTS STEEL CO.

A Division of Lukens Steel Company, Coatesville, Pennsylvania



LOWER COST PER POUND ROLLED

WHEN you use Texaco to lubricate your rolls and gear trains, you can count on the smooth, uninterrupted operation that means higher production and lower unit costs. For example—

Texaco Regal Oil in the circulating systems of your roll stands assures full protection for oil film bearings. It separates easily and quickly from water, resists oxidation, emulsification and sludging.

Texaco Meropa Lubricant in reduction gears assures smoother operation, longer gear and bearing life. It has exceptionally durable "extreme pressure" characteristics, stands up in severest service.

Let a Texaco Lubrication Engineer help you produce more at lower cost. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N.Y.

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TEXACO Lubricants, Fuels and Lubrication Engineering Service

TUNE IN . . . TEXACO STAR THEATER starring DONALD O'CONNOR or JIMMY DURANTE on television . . . Saturday nights, NBC.

Metalworking Outlook

Two Cents More for Steel Firms

Although steelworkers will get pay boosts that average slightly more than 15 cents an hour, the actual cost to employers will be a couple of pennies above that (page 45). The reason: The base pay boost will raise the expense of social insurance, vacations, overtime and all the other fringes that now figure so prominently in payroll costs.

No Monopoly in Autos

Look for the government to ease its investigations of and suits against alleged monopoly by various auto companies. Spokesmen for all the independents appearing before a Senate Judiciary Subcommittee were unanimous in their belief that no monopoly exists. Studebaker-Packard Corp.'s James J. Nance says most of the independents' problems last year arose because they were unready for the buyers' market. He warns that it's up to the smaller companies to expand their share of the market to survive.

Coming: More Stock Buying Plans

General Motors Corp. follows on the heels of Ford Motor Co. in readying a stock purchase program for salaried employees. The GM plan must still be approved by stockholders before it's legal for the more than 100,000 GM salaried people to participate. In the cards, but not immediately, is the extension of these plans to hourly workers. The United Auto Workers will resist such an extension.

Corporate Income Tax Time

Take a look at the Internal Revenue Service's new Form 1120-ES for a corporate declaration of estimated income tax. The Internal Revenue Code of 1954 provides that beginning in the ninth month of the current taxable year corporations that can reasonably expect a tax liability in excess of $100,000 for the year must file an estimate and make a payment. In the 12th month of the taxable year, they must make a second payment of the estimated tax. The balance of the actual tax must be paid in equal installments in the third and sixth months following the close of their taxable years.

Foreign Trade Up

Foreign trade prospects are improving in all lines but capital goods, say experts. West Germany is especially strong as a competitor in capital goods, and producers in Switzerland, Italy and France are stepping up their sales efforts in other countries. But in other lines, U.S. exporters may hit all-time

Metalworking Outlook

highs this year, records that may even be surpassed in 1956. In 1954, American exports were four times higher in dollars than in 1939.

Freight Car Shortage?

The old specter of freight car shortages is upon us again. Car ownership of Class I railroads on June 1 was 1,719,709, compared to 1,768,217 a year earlier. The daily average surplus of freight cars had dropped by June 18 to 7531, against 82,109 a year earlier. As a result of all this, freight car orders are rising; the order backlog exceeds 55,000 now, compared to a mere 16,886 on June 1. Some of these can be delivered by fall, to keep the specter under control.

Two Commerce Departments?

We may end up with two Commerce departments before long if the Small Business Administration keeps on growing at its present rate. In Minneapolis, for example, SBA has 28 employees compared with 6 for Commerce. The politicians like SBA even though it duplicates some functions the Commerce department has been performing for years. Predicts the National Association of Manufacturers gloomily: "Sooner or later, someone will propose giving SBA Cabinet status."

Fewer Defense Contractors

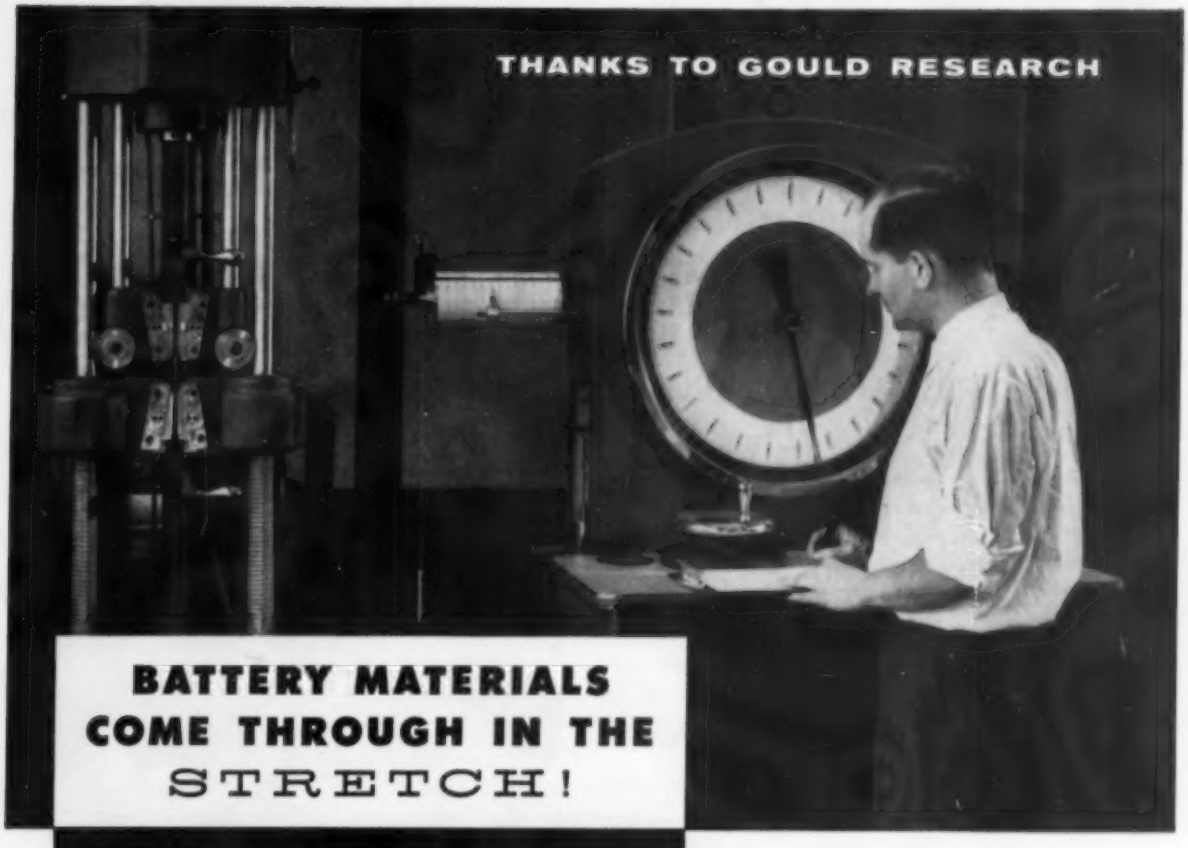
Look for the Defense department's alphabetical register of defense contractors to show a reduction in the number from about 37,000 to 27,000. The drop comes because: Some firms previously listed have merged or gone out of business; production allocation planning has been reduced to about 1000 end-items and components. The cutback doesn't reflect any trend toward a single source of supply.

A Peek at Tomorrow's Kitchen

Your wife's kitchen of tomorrow may have a new appliance solely for the storage and heating of frozen foods. It might be a combination unit that stores frozen precooked foods and, at the touch of a button, sends a package into a thawing and heating chamber. Westinghouse Electric Corp.'s E. K. Clark also predicts more built-in appliances and more special purpose cooking units.

Straws in the Wind

The Senate Appropriations Committee has approved a public works bill providing more than $1.8 billion for the Atomic Energy Commission, the Tennessee Valley Authority and other reclamation and rivers and harbors work . . . Corporations with assets of less than $1 million are contributing 1.37 per cent of net taxable income to educational purposes, compared to an average for all corporations of 0.78 per cent; corporations with assets over $100 million contribute 0.43 per cent . . . Boeing Airplane Co. predicts a decline in aircraft business from the peak reached last year . . . Present federal curbs on exports of iron and steel scrap will continue unchanged in the July-August-September quarter.



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Shown above is a tensile strength testing machine in the Gould Battery Research Laboratory at Depew, N.Y. It is capable of exerting a pull of 10,000 pounds on any material. Gould uses it to make sure that every component of a Gould Battery—grids, connectors, posts, jars—has strength and ruggedness far above required standards.

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For the full story on Gould Research, send for Booklet 749.

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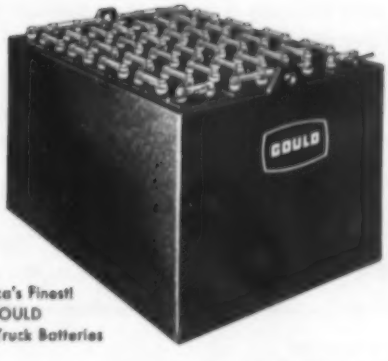

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15 years of testing in atmosphere show

New ARMCO ALUMINIZED STEEL outlasts Commercial Galvanized 3 to 1

Combines corrosion-resisting properties of aluminum with strength of steel

A new Armco aluminum-coated steel that resists atmospheric corrosion at least three times as long as the coating on commercial galvanized steel sheets is now available for use in your products. Called Armco ALUMINIZED STEEL® (Type 2), it has all the surface advantages of aluminum plus the strength of steel.

Besides strength and corrosion resistance, this new steel gives your products these benefits:

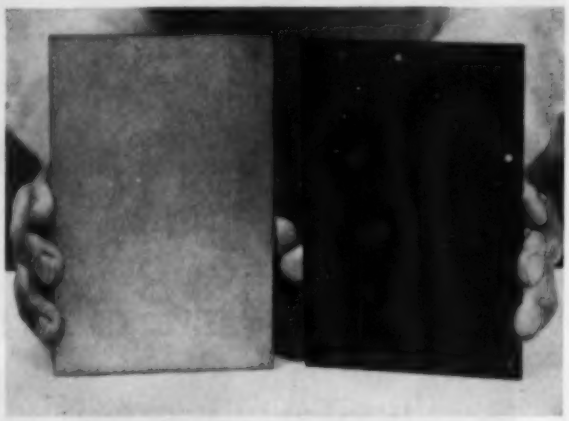
1. It reflects 80% of the radiant heat thrown against it.

2. It resists fire damage. At 800 F, for example, it has more than ten times the strength of aluminum.

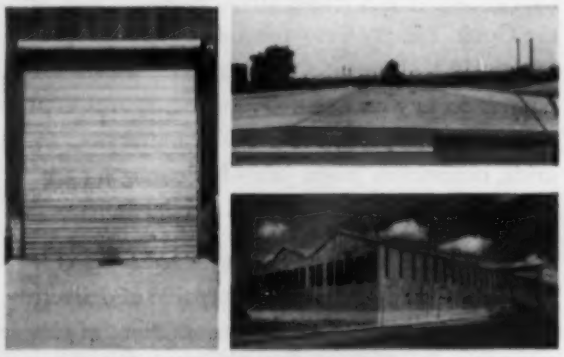
3. It withstands forming. ALUMINIZED (Type 2) also can be embossed and spun.

4. It generally costs less per square foot than aluminum, even when thickness is equal. And because ALUMINIZED STEEL permits lighter gages for comparable strength, it may save you as much as 40% to 50%.

This exciting new steel can give your "outdoor" products big sales advantages. Get the full story on sizes, gages and prices. Mail the coupon today.



In atmosphere corrosive enough to cause a standard galvanized coating (right) to fail completely in 12 years, Armco ALUMINIZED STEEL (Type 2) looked like this (left) after 15 years. Cleaned samples show the aluminum coating is still giving full protection to the base metal.



Resistance to atmospheric corrosion makes ALUMINIZED (Type 2) an ideal metal for rolling doors, roof deck, buildings and similar applications.

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SPECIAL STEELS

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Inflationary Bias

In the early postwar years, economists were wont to say, "as steel goes, so goes the economy." The yearly rounds of steel wage increases, followed by price advances, apparently set the pattern for the inflationary spiral characteristic of the later 1940s. The pattern was followed in other wages and prices and soon was reflected in the cost of living.

The latest settlement, involving a larger than expected wage increase and a larger than expected price advance, is causing some concern as to its inflationary effects.

The concern is warranted, but probably not to the degree most people believe.

Annual wage and price increases have become pretty well accepted. Over the last three years they have been absorbed by the economy without inflationary effects.

In 1952, steelworkers won 16 cents an hour; prices went up $5. In 1953, the wage settlement was 8½ cents; prices advanced $4. Last year wages went up about 12 cents; prices were raised $3.

But since 1951, the consumer price index has fluctuated within a narrow band between 112.4 and 115.4, based on 1947-1949 as 100. Wholesale prices actually declined from an average of 113.7 in the second half of 1951 to 110.2 in the first five months this year. Higher productivity, greater efficiency, automation or whatever gives our economy its marvelous elasticity offset the higher wages and prices.

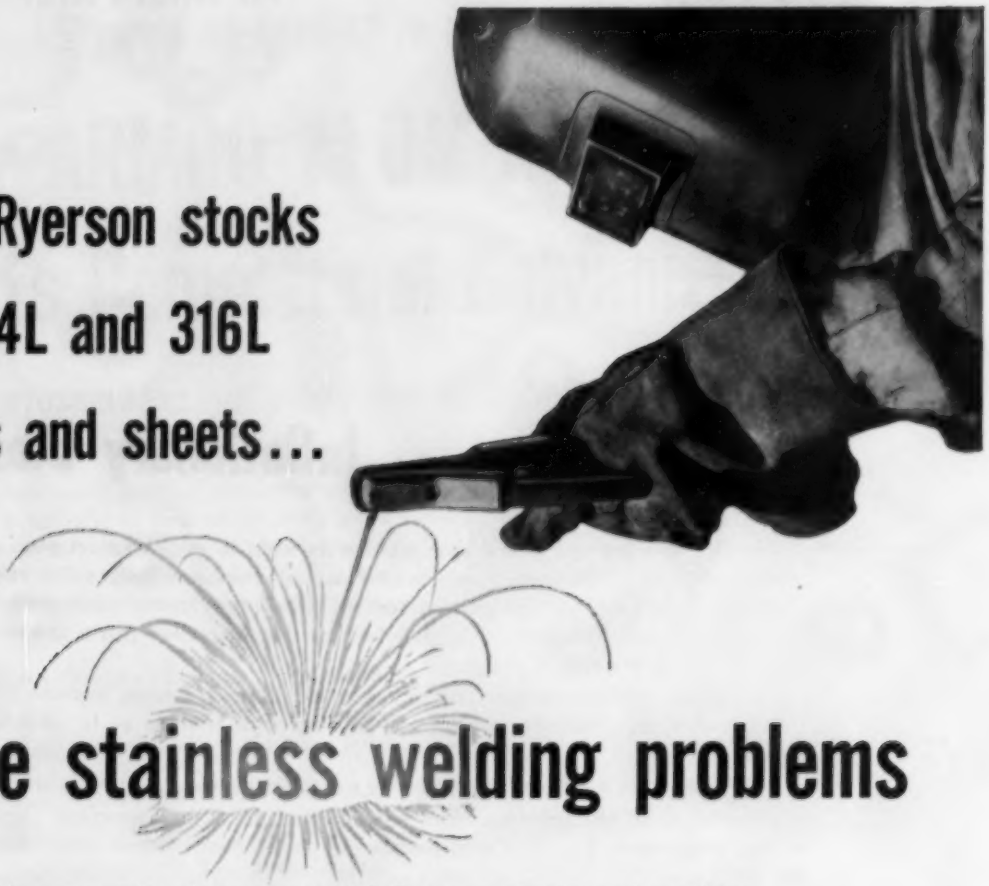
Statisticians figure the increase in productivity at 2½ to 3 per cent a year. This year's wage increase amounts to 7½ per cent; the price advance to 5.8 per cent. Unless there is a sharp spurt in productivity, the wage-price increases are outrunning the productivity gain. We reasonably can expect at least an inflationary bias.

How much inflation we have depends on how the increased costs are passed along. Some wage and price increases will be necessary down the line. But let's not go overboard.

Walter J. Campbell

MANAGING EDITOR

New Ryerson stocks of 304L and 316L plates and sheets...



Solve stainless welding problems

One example of many special Ryerson steels and services

For many years, fabricators have had trouble with carbide precipitation in welding and annealing stainless steels. Now, new Ryerson stocks of low-carbon stainless solve this long-standing problem.

A small part of Ryerson stainless stocks—the nation's largest

Two types are available for quick shipment from your nearby Ryerson plant—plates and sheets in Type 304L and Type 316L. (Sheets are available in 10 to 16 gauge inclusive. Plates from 3/16" to 2" in thickness.) Both types generally eliminate the need to anneal after welding—can be used in place of more expensive stabilized stainless when stress relieving is necessary.

With the addition of these new low carbon types, you can now draw on Ryerson stocks for 2221 different kinds, shapes and sizes of stainless steel. And Ryerson stocks of carbon and alloy steels are just as large and diversified. So for stainless that solves welding problems—and every other steel requirement, call your nearby Ryerson plant.

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New Steel Wages

(Effective July 1)

Job Class 1 Up 11.5 cents
Increment between job groups raised 0.5 cent
Average Boost: 15 cents

New Steel Prices

(Effective July 6)

Average Rise: $7.35 a ton, 5.8 per cent
Range: $4.50 (rerolling slabs) to $17 (electrical sheet)

How Average Hourly Steel Earnings Climb

1955 (last six months)	$2.55	1950	1.75	1944	1.22
(first six months)	2.40	1949	1.70	1943	1.14
1954	2.33	1948	1.63	1942	1.06
1953	2.27	1947	1.51	1941	0.96
1952	2.07	1946	1.35	1940	0.85
1951	1.95	1945	1.25	1939	0.84

Source: American Iron & Steel Institute

Will Steel Boost Spur Inflation?

LOOK FOR the steel wage and price boosts to trigger an inflation in the general price structure.

The consumer price index (1947-1949 = 100) has stayed within the range of 112.4 and 115.4 since November, 1951. The wholesale price index (1947-1949 = 100) hit 109.9 in May, actually below the index's level for late 1951.

The Reason Why—The wage increase that averages 15 cents an hour and the price boost that averages $7.35 a ton may give a one-two punch to the general price stability because both are higher than expected. The steel wage settlement may lead to higher settlements in other industries this year that will inflate costs and prices. Wage grants thus far this year have been averaging less than 8 cents an hour. The steel price increase, which was originally expected to be only $6 a ton, will fan out into everything in which the metal is used to become another pressure for higher prices.

The price action is the most drastic since 1948 when steel quotations went up $8 after a 13-cent wage grant. In 1949 they rose $4, in 1950 $5.50, in 1952 $5, in 1953 $4 and in 1954 $3.

Higher Steel Prices Needed?—When he was chairman of U.S. Steel Corp., Ben Fairless often said: "Prices are too low relative to costs." Steel company earnings are improving, but they're still too low to support the giant expansion ahead. They were 6.02 cents per sales dollar in 1954, 5.61 cents in 1953, 4.91 cents in 1952, 5.71 cents in 1951 and 7.99 cents in 1950.

Steelmaking costs immediately go up about 40 cents for every penny in higher wage costs. But that does not count the higher costs that come along some time after basic steel boosts in goods and services purchased. So, the $7.35 hike this year anticipates some of those coming increases, an anticipation often not made in former years, notably 1954 and 1953.

Wage Detail—The new wage scales for most of steel were effective July 1. The rate in job class 1, the lowest, is increased 11.5 cents per hour. The step-up between each of the 32 job classes becomes 6 cents instead of the old 5.5 cents. That averages out to 15 cents overall, but the more skilled workers will get somewhat more than that.

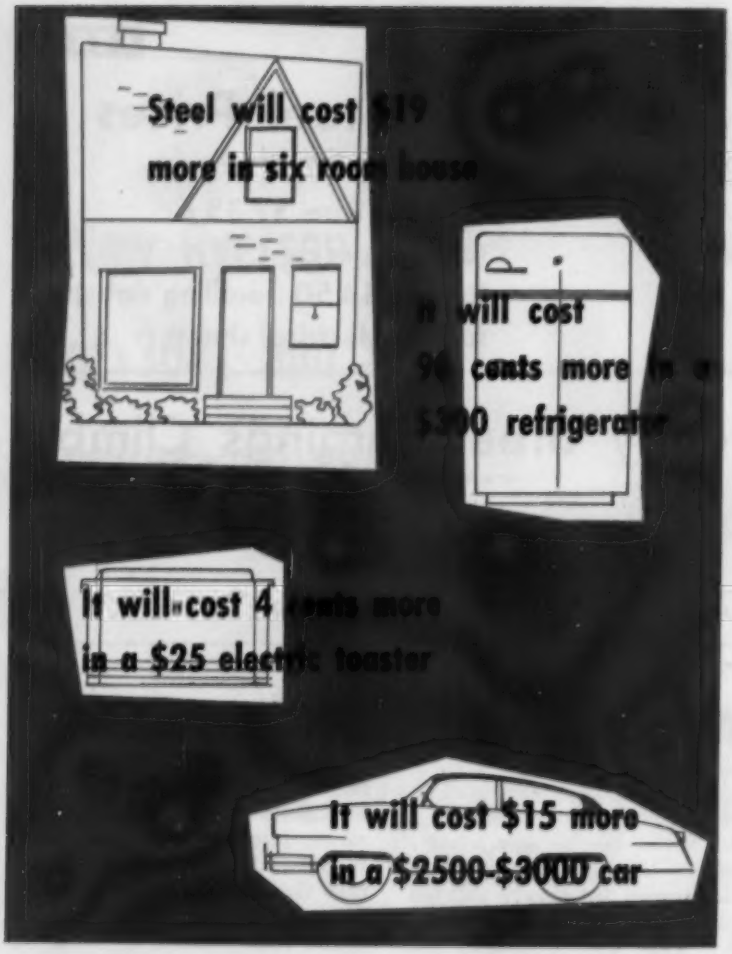
The brief strike that preceded the settlement was sheer window dressing. The tonnage loss resulting from it and the long July 4 weekend was only a little greater than if just the holiday had been observed. But there was a loss, whose primary effect will be to lengthen delivery dates and disrupt the shipping routines of the producers.

The Real Reason — With the strike, the steelworkers' president, David J. McDonald, in effect was saying to his members: "Look how tough I can be to get you every last penny."

He probably did get an extra penny or so, and that meant more pennies added to the steel price which rose 5.8 per cent. Effective July 6, U. S. Steel Corp.'s new quotations (compared with the old) are:

(All figures cents per pound unless otherwise denoted)

	New	Old
Carbon steel:		
Blooms, billets, slabs—forging quality	$84.50 N.T.	78.00 N.T.
Blooms, billets, slabs—rerolling quality	68.50 N.T.	64.00 N.T.
Tube rounds	103.50 N.T.	96.50 N.T.
Skelp	4.225	3.90
Hot-rolled bars and small shapes	4.65	4.30
(Fairless Wks.	4.80)	4.45
Cold-finished bars	5.90	5.40
Standard structural shapes	4.60	4.25


Steel will cost $19
more in six room house
It will cost
96 cents more in a
$300 refrigerator
It will cost 4 cents more
in a $25 electric toaster
It will cost $15 more
in a $2500-$3000 car

CB's (Including CBL, CBJ and CB sections)	4.60	4.25
Bearing piles (CBP sections)	4.60	4.25
Sheet piling	5.45	5.075
Plates	4.50	4.225
Floor plates	5.575	5.275
Standard tee rails —No. 1 O. H.	4.725	4.45
Light rails	5.65	5.35
Tie plates	5.625	5.275
Joint bars for standard rails	5.825	5.425
Track spikes	7.90	7.30
Axles	7.25	6.75
Hot-rolled strip	4.325	4.05
Hot-rolled sheets (18 ga. and heavier)	4.325	4.05
(Fairless Wks.	4.375)	4.10
Cold-rolled sheets	5.325	4.95
(Fairless Wks.	5.375)	5.00
Vitrenamel sheets	5.90	5.375
Galvanized sheets, regular	5.85	5.45
Concrete Reinforcing bars	4.65	4.30
(Fairless Wks.	4.80)	4.45
Long terne sheets	6.25	5.85
Electric sheets (electrical grade—cut lengths 22 ga.)	9.95	9.10
High strength steel:		
USS Cor-Ten		
Standard structural shapes	6.75	6.40
CB sections	6.75	6.40
Plates	6.725	6.45
Hot-rolled bars and small shapes	6.80	6.45
Hot-rolled sheets	6.375	6.10
(Fairless Wks.	6.425)	6.15
Galvanized sheets	8.60	8.20
Cold-rolled sheets	7.875	7.50
(Fairless Wks.	7.925)	7.55
Hot-rolled strip	6.425	6.15
USS Man-Ten		
Standard structural shapes	5.60	...
CB sections	5.60	...
Plates	5.55	...
Hot-rolled bars and small shapes	5.45	...
Hot-rolled sheets	5.175	...
(Fairless Wks.	5.225)	...
Hot-rolled strip	5.175	...
USS abrasion resisting		
Plates	5.65	...
Hot-rolled bars and small shapes	5.80	...
Hot-rolled strip	5.475	...
Hot-rolled sheets	5.475	...
Alloy steel:		
Ingots	69.00 N.T.	65.00 N.T.
Blooms, billets, slabs	96.00 N.T.	86.00 N.T.

Hot-rolled bars (Fairless Wks.	5.575 5.725)	5.075 5.225
Bar and structural shapes	5.65	5.20
Plates	6.30	5.80
Hot-rolled strip	7.20	6.70
Wire and wire products:		
Wire rods, carbon		
Donora, Cleveland, Joliet and Fairfield	5.025	4.675
Worcester	5.325	4.975
Cold-rolled low carbon strip		
Cleveland	6.45	5.75
New Haven	7.20	6.50
Worcester	7.30	6.60
Wire—mfrs. coarse, bright low carbon		
Cleveland, Donora, Joliet, Duluth, Rankin, Waukegan and Fairfield	6.25	5.75
Worcester	6.55	6.05
Premier spring wire—high carbon		
Cleveland, Donora, Duluth and Waukegan	7.60	6.90
New Haven, Trenton and Worcester	7.90	7.20
MB spring wire —high carbon		
Cleveland, Donora, Duluth and Waukegan	7.90	7.20
Trenton and Worcester	8.20	7.50
Nails		
Donora, Duluth, Joliet, Rankin and Fairfield Col.	152	137
Worcester Col.	158	143
Polished staples		
Donora, Duluth, Joliet, Rankin and Fairfield Col.	152	138
Worcester Col.	158	144
Wire—merchant quality —Annealed		
Cleveland	7.40	6.90
Donora, Duluth, Joliet, Rankin and Fairfield	7.40	6.90
Worcester	7.70	7.20
Wire—merchant quality —galvanized		
Donora, Duluth, Joliet, Rankin and Fairfield	7.80	7.30
Wire—barbed		
Donora, Duluth, Joliet, Rankin and Fairfield Col.	175	159
Woven fence		
Donora, Duluth, Joliet, Rankin and Fairfield Col.	162	146
Bale ties		
Donora, Duluth, Joliet and Fairfield Col.	173	155
Stainless steel:		

Mill price bases and extras are increased approximately 5.8 per cent.

(*Please turn to page* 142)

SUP Faces Three Hurdles

Any one of which can nullify the plan

1. Federal Income Tax Rulings . . .

The company shall not be required at any time to make any contribution to the general fund unless and until it shall have received from the Commissioner of Internal Revenue a currently effective ruling or rulings, satisfactory to the company, holding that such contribution shall constitute a currently deductible expense under the internal revenue code . . .

2. Fair Labor Standards Act Rulings . . .

The company shall not be required at any time to make any contribution to the general fund unless and until it shall have received from the United States Department of Labor a currently effective ruling or rulings, satisfactory to the company, holding that no part of such contribution shall be included in the regular rate of any employee . . .

3. Supplementation of State System Unemployment Compensation Benefits . . .

No benefit shall be payable with respect to any pay period . . . unless it shall have been established to the satisfaction of the company by administrative rulings from competent state authorities or by statutory amendments in states in which at least two-thirds of the employees in active service are employed that supplementation is permitted.

If Achieved, SUP Won't Be GAW

MANAGEMENT MEN who should know better are contributing undeserved stature to Walter Reuther.

Repeated boasts by Mr. Reuther that a guaranteed annual wage would be achieved have not been made good. The plan, if it goes into effect, deals with supplementary unemployment payments. These payments are not guaranteed, they are not annual and they are not a wage.

Wording — Supplementary unemployment payments are the only words that can accurately be used to describe what Mr. Reuther has achieved. To infer that a guaranteed annual wage is remotely hinted at in the contracts signed is false terminology adding a stature to Mr. Reuther which he does not deserve.

Yet because Mr. Reuther now says he has achieved GAW, management grudgingly admits his strength rather than hitting hard his inability to make good his boast.

Not Yet Achieved—To strike at the most fundamental misconception first, the plan is not yet achieved. The contract has been signed, but the conditions carefully set forth by the auto companies must first be met. That these conditions are included in the contract evidences some doubt that they can and will be met.

A company stipulation is that the Commissioner of Internal Revenue must rule contributions to the fund constitute a currently deductible expense under the Internal Revenue Code. If such a ruling should not be obtained—and there is considerable argument possible as to why it should not be since the money is not being spent but placed in a fund disbursed at direction of the company—the plan will not go into effect.

Another Point — Of equal or greater importance is a ruling required from the Department of Labor, in essence saying that SUP does not involve unfair competition for labor under the Fair Labor Standards Act. The technicality is whether or not all or any part of the contribution shall be included in the regular rate of any employee. The fact that eligibility to draw on the fund depends on hours worked makes this a very moot problem, indeed, and could also nullify the plan.

The third contingency is that supplementation of state system unemployment benefits must be established as legal by administrative rulings from competent state authorities or by statutory amendments in states in which at least two-thirds of the employees in active service are employed. No benefits shall be paid for any pay period commencing prior to June 1, 1957, unless this stipulation shall have been met. This stipulation not being met by that date, all obligations of the company under the plan shall terminate.

Three Hurdles — The point is very clear that three important and difficult hurdles must be overcome before the plan can go into effect at all.

On the presumption that these stipulations are met, other clauses of the contract assume interest. One of the most interesting which may in itself be the basis for legal battles is the method of circumventing the letter of state unemployment compensation laws in a manner which may or may not be subsequently proved legal.

Tricky—Instead of applying for and receiving supplementary unemployment compensation payments on a weekly basis, the worker may elect to remove himself from the unemployment compensation rolls of the state every third or fourth week. At this time he will be paid by the company three or four weeks' supplementary unemployment payments. He then returns to the state rolls and repeats the process, the argument being that he is not on the rolls when receiving outside remuneration.

Though this complies with the letter of most state laws, legislators who have not permitted direct supplementary payment, thus forcing the adoption of this circumventing procedure, are not likely to leave such loopholes unplugged for long. Remember, this plan ap-

How the Company Is Protected Under the SUP Contract

1. Liability is Limited . . .

Benefits shall be payable only from the fund, expenses of administration shall be charged to the fund, and if the fund position for any week is less than 4 per cent of the maximum funding position no benefits shall be paid.

2. Company Authority . . .

The company's sole and complete authority and discretion to establish, regulate, determine or modify at any time levels of employment, hours of work, the extent of hiring and layoff, production schedules, manufacturing methods, the products and parts thereof to be manufactured, where and when work shall be done, marketing of its products or any other matter related to the conduct of its business is not affected by the plan.

3. Eligibility . . .

Applicants must meet usual requirements for state unemployment compensation as determined to the satisfaction of the company including willingness to accept other available work at the same plant or at another plant in the same area as defined in the collective bargaining agreement.

plies only to those states not in the group employing two-thirds of the company's workers which must approve supplementary unemployment payment if the plan is to go into effect at all.

Headaches—Other problems revolve around the actual operation of the plan if all goes smoothly. Suppose a worker is laid off by an auto company. Under the plan he must be eligible for state unemployment compensation which means he must be available and willing to accept suitable other employment. If he accepts such employment, he is no longer an employee of the auto company and is ineligible for the benefits. If he refuses, he also is ineligible since he loses state unemployment compensation eligibility.

Even if the worker finds himself in the happy position of being eligible on all counts, if the fund has fallen below 4 per cent of maximum funding he receives no payment. Particularly important is the fact that a system of credits is set up in such a way that low-seniority workers, most subject to layoff, lose credit most quickly when the fund starts to get low and accumulate credit most slowly as the fund is building up.

The Point—Other conditions of the contract not generally recognized or understood by management men could be cited, but the point to be made is this: The auto companies have signed a contract which is to supplement state system unemployment benefits to the levels carefully defined in the contracts.

The plan may never go into effect. If it does go into effect, it will in no way, shape or form be a guaranteed annual wage.

Why Made? — Defending this plan as more than supplementary unemployment payments may prove more difficult to Mr. Reuther with his CIO workers than with management. Workers will find it difficult to understand that something which does not offer 40 hours pay 52 weeks a year is a guaranteed annual wage. Because many industry observers feel Mr. Reuther might have achieved such a plan for some of his workers and established the principle of the guaranteed annual wage, which this settlement does not, the question arises as to why this settlement was made.

Any answer must be speculative, but several factors may be assayed largely predicated upon the actions of Walter Reuther.

Motives—At the bargaining table with the automakers, it is hard to presume Mr. Reuther was unaware of the competitive pressure industry competition gave him against the automakers individually. Yet rather than playing this pressure to the hilt, he made a settlement which most observers agree was less than might have been achieved.

The settlement, therefore, must be assumed to have been one predicated on giving some coverage to all workers rather than an actual guaranteed annual wage to a few. It was an attempt to get a management concession which would prove popular with the merged labor organization and establish Reuther leadership in what could loosely be called "a social objective."

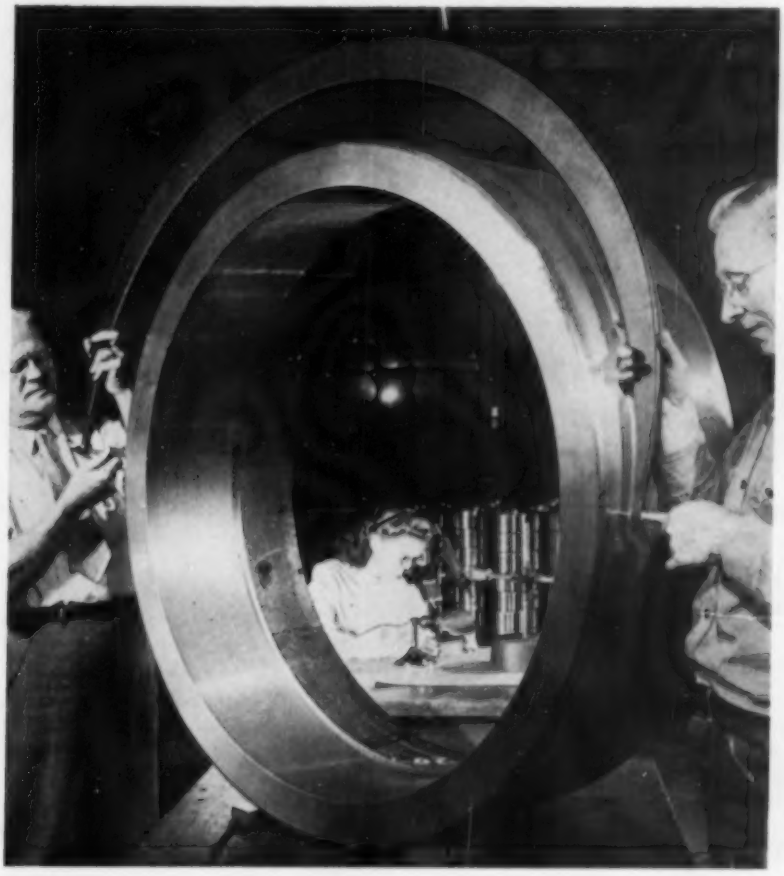
Labor Party—This achievement of a social objective coupled with Mr. Reuther's mystifying willingness to assume a back seat in the merged AFL-CIO seems to point in only one direction: Objectives of social leadership higher than the labor organization itself.

Walter P. Reuther, it seems clear, is aiming at the implementation of a labor party in this country with himself as head. The social objectives championed by Mr. Reuther make it clear that the political field is the real battle ground and the political wars touched off by the supplementary unemployment payment should help precipitate a clear labor and anti-labor cleavage on which such a party can be formed.

Paradox—Management's willingness to accept the fact that a guaranteed annual wage has been achieved enhances Mr. Reuther's popularity with his would-be constituents and can do much to further his cause.

The call of Henry Ford II for auto industry unity in negotiations to present a united front to labor some day may well be ranked one of the most significant statements of our times. Labor is growing and unifying. Its direct coalition into a party is only a matter of time.

The guaranteed annual wage does not exist. Increasing labor strength does. To admit the first is to enhance the second.



Even on this 48-in. SKF bearing ring, tolerance must be held to 0.016-in.

Bearing Sales Roll for Top Year

BALL AND ROLLER bearing sales will run 20 to 25 per cent higher this year than last, and will surpass the peak year of 1953 by 10 to 15 per cent.

What Happened?—The surge in automotive production boosted ball bearing sales by some 40 per cent the first half. The change-over in auto models later this year may slow sales temporarily, but purchases by automotive producers still will be 35 per cent ahead of 1954's.

Other industries are contributing, too. Sales to manufacturers of electric motors, farm and construction equipment, household and textile machinery are out-running last year's. In some instances, gains are 50 per cent.

Score Card — Competing these days are more than 60 domestic bearing manufacturers (one large manufacturer estimates 66), of which some 25 produce ball bearings exclusively. Throughout the world more than 140 make the antifriction types (ball and roller, including needle).

Export sales, which ran about 5 per cent of domestic sales in 1954, may roll in at 6 per cent this year, with Canada the principal buyer, followed by Brazil, Australia, Mexico and France. However, foreign competition is being felt at home and abroad. Foreign prices are helped by inexpensive labor. Wages run only 35 to 40 cents an hour.

The electronic and guided missile industries are calling for more bearings. Improved railroad equipment demand should provide an additional second-half sales stimulus to at least three bearing manufacturers which specialize in railroad requirements.

History—Ball and roller bearing sales began to accelerate late last summer. This was especially true in ball bearings, which account for about half of the $550 million annual antifriction bearing market.

More Demand — Split inner-ring bearings, which have the ability to take thrust loads in both directions, are increasing in use. For atomic energy applications, more nickel and cobalt alloys are being used to produce bearings which have high resistance to extreme temperature and corrosion.

ASM Starts Home-Study Plan

American Society for Metals, Cleveland, is preparing 42 courses on all phases of metals, metalworking and metallurgy.

The courses are planned to enable the average skilled and semi-skilled worker with little or no formal metallurgical education to achieve a thorough working knowledge of the metal he fabricates.

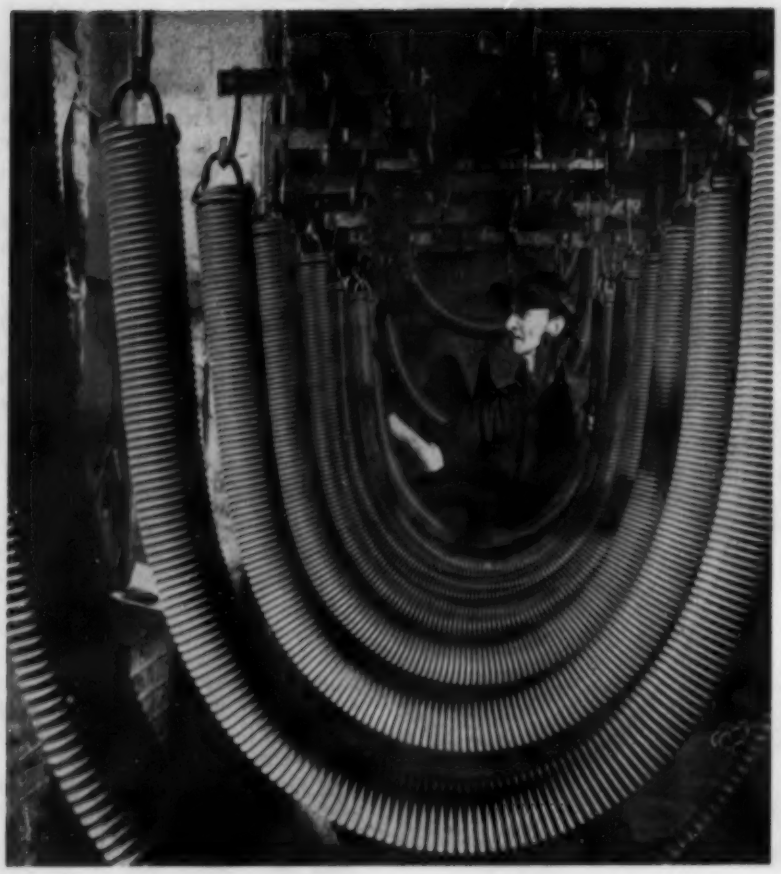
Specific production problems in metalworking and current practice of industry are given. The courses, both home-study and on-the-job, are designed to spell out the behavior of metals under all manner of stresses in production.

Injury Rates Hit New Low

The injury-frequency rate for the first quarter of 1955 dropped 4 per cent below the rate set during the corresponding period of 1954, establishing a new low for any first quarter.

Following a seasonal pattern, the average of 11.1 disabling injuries for each million man-hours worked during the first quarter was slightly higher than the preceding quarter, says the Bureau of Labor Statistics.

The trend to lower injury-frequency levels, which started in the last half of 1953, may be easing off. In comparison with the same quarter of the preceding year, the rate for the second quarter of 1954 showed an improvement of 21 per cent. Improvement for the third quarter was 16 per cent, in the fourth quarter it was 11 per cent and only 4 per cent in the first quarter of 1955.



Paul Maudlin, springmaker, has a hand in . . .

Giving Garage Doors a Lift

THIRTY years ago, Kokomo Spring Co., division of Superior Machine Tool Co., Kokomo, Ind., got together with the inventor of the overhead garage door to develop a spring that would take the work out of getting into the garage.

Today, garage door springs account for more than 50 per cent of Kokomo's output. The company's operations cover coiling, stress relieving, japanning and shipping.

King-Size — The springs are coiled on Torrington or Sleeper & Hartley machines from wire made at the Monessen, Pa., works of Pittsburgh Steel Co. Some of the big ones run up to 18-ft long and weigh as much as 300 lb. One standard 14-ft spring is produced in 12,000-lb lots in an 8-hour shift. These big springs are shipped to the doormakers, who cut them into shorter lengths for installation.

By way of a change of pace, Kokomo also makes springs for garage door locks—so small that 850 will fit in a 1-oz shotglass.

Variety—Ranging between these extremes are torsion, compression and extension springs for other types of garage doors. The biggest volume is in 25 and 27-in. long extension springs. The company also makes springs for hay balers, cultivators and other farm machinery, excavators and other construction equipment. Miscellaneous products include 125-ft long springs used to clean out sewers and other pipes.

New Look in U.S. Buying?

Policies must be changed to fit permanent, high-level military procurement, says MAPI

MILITARY procurement is no longer an emergency proposition. It will probably continue to run at a high $18 billion a year as long as the cold war lasts.

For this reason, says Charles W. Stewart, president, Machinery & Allied Products Institute, basic changes must be made in armed services procurement regulations. The Defense department recently asked MAPI for comments on a suggested revision of the regulations. Here's how Mr. Stewart's reply shapes up:

New Base—Most companies doing government work, says Mr. Stewart, must now give a lot of attention to their commercial lines. The government is therefore in competition with industry, and should bear its fair share of the normal costs of doing business.

Cost principles should be revised to conform with generally accepted commercial accounting practice. Contractors should be allowed to use standard cost systems and allowances also should be made for advertising, general selling, distribution and entertainment expenses.

Benefits—If the government allows such costs, says MAPI, contractors will be able to attain lower production costs through increased volume and the government will benefit.

The institute recommends liberalization of the sections on allowances for incentive-type compensation. Changes are recommended in depreciation allowance provisions, insurance cost allowances and in the rules for pricing materials and supplies.

No Rule Book—MAPI points out that while some contract costs are clearly allowable or disallowable by any reasonable man's standard, there is an undefinable body of costs which will vary from contract to contract. In these areas —advertising, profit sharing, etc. —"The regulations should be set up to allow for individual contract negotiations."

Bowser takes its products on tour, finds . . .

Traveling Trade Show Ups Sales

A SEATTLE BREWER took a look at a proportioning device on display at Bowser's road show and pronounced it ideal for blending beer. It has replaced a method used for over 100 years.

That's the kind of reaction R. Hosken Damon, president and board chairman of Bowser Inc., Chicago, is looking for. Called Bowserama, the show represents an investment of three years and $3 million.

Is Trip Necessary? — Bowser took its products traveling to find more uses for them. The show, which has been on the road six months, also helps keep Bowser employees abreast of the company's diversification program.

The name Bowser once meant only gasoline pumps. Now, through its divisions and subsidiaries, it has added automatic coin counters, parking systems, incinerators, fare boxes, electric filing equipment, liquid control systems, testing equipment, locks and condensers.

Behind the Scenes—The show, 14 tons of equipment, machines and displays, goes into two vans. Props and displays are made of conventional materials — plastic, wood and metal. Setup is quick; the booths fit together without nails. The location is usually a meeting room in a hotel.

The show has visited Chicago, San Francisco, Los Angeles, Salt Lake City, Utah, Ft. Wayne, Ind., Detroit, Cleveland and Dayton, O. At each stop Bowser employees get a first look. Invitations go to top civic, business, technical and military people. Each guest registers to give Bowser a unique prospect list.

Bowser says: "People come here for business. When they ask a question, we have to have the answers for them." About 30 technicians and two division presidents travel with the show. On an average stay of three days, attendance ranges from 1500 to 2000.

DOD: Forced to Compete?

While the Small Business Committees of Congress press to get government out of competition with business, section 638 of the Military Appropriations Bill for '56 will prevent just this.

The provision bars the Department of Defense from terminating any such activities which its civilian personnel has been conducting for more than three years without first presenting economic justifications to both the House and Senate appropriations committees. Either committee could veto the proposed action within 90 days.

This means that any DOD effort to get out of competition with business will be slowed to a virtual standstill. While making a product on a military post may look as though it is more economical, it is not often the case. Example: A government agency asked an independent accounting firm to audit the books of a plant which was making a product on a military reservation. The government believed that it was saving some $600,000 a year by manufacturing the product.

The accountants reported that available information was obsolete and inadequate and that the data did not include costs for: 1. Purchasing supplies. 2. Transportation, inbound and outbound. 3. Packaging, palletizing or warehousing. 4. Administering payrolls. 5. Necessary safety programs. 6. Taxes (local, state, federal). By adding these factors—using minimum industry figures for a civilian plant of the same type—the accountants reported that this federal plant was not saving $600,000 but was losing $1 million. While this may not always be the case, Section 638 will keep many "losing plants" in operation.

SBA Lists New Products

Information on 55 products, inventions and commercial ideas is given in a new issue of the Small Business Administration's "Products List Circular." Also included are abstracts of 30 government-owned patents.

Typical show brings civic, business, technical and military people to meet Bowser's men and products

Where U. S. Can Save

Estimated by Hoover Task Forces

	(per annum)
Budget & Accounting	$4,000,000,000
Depot Utilization	253,000,000
Federal Medical Service	290,000,000
Lending, Guaranteeing, Insurance Activities*	200,000,000
Overseas Economic Operations	360,000,000
Paperwork Management, Part I	255,000,000
Paperwork Management, Part II	33,300,000
Personnel and Civil Service	48,500,000
Real Property Management	185,000,000
Special Personnel Problems, Department of Defense	388,800,000
Subsistence (food and clothing)	400,000,000
Transportation	151,500,000
Use and Disposal of Federal Surplus Property[1]	2,000,000,000

* Commission estimate
[1] Per annum for first four years; $1 billion thereafter

Hoover Commission: Finale

LAST WEEK, amid shouts of praise and condemnation, the Hoover Commission on Organization of the Executive Branch of the Government sent its four remaining reports to Congress. This included the "finale" which summarizes the commission's activities since August, 1953.

Savings—Task forces, which reported directly to the commission, estimate that the government can save some $10 billion (see chart). Beside the savings listed above, the task force reports indicate that there are other areas—intelligence, military procurement and water and power activities—where substantial savings can be made. The Department of Defense will also be able to save money, says the task force, if it will develop a sound business organization.

Some of the commissioners were congressmen. They have already reserved the right to vote against various commission reports. Meanwhile, the Citizens Committee for the Hoover Report is beating the action drum. Clarence Francis, national chairman, reports: "Early and vigorous action to implement the great majority of the Hoover commission recommendations is a definite administration policy."

DOD—A more efficient business organization for the DOD is a must, says the commission. The report (Business Organization of the Department of Defense) lists 19 recommendations, nine of which DOD officials can put in effect, ten which would require legislation. Big point: There should be a new and separate civilian-managed Defense Supply & Service Administration which would serve all defense departments in purchasing, inventory control and distribution.

Power—In the most controversial survey to date—the Water Resources & Power Report—the commission suggests that the government stop building steam-generation plants for power. Recommendation: Private utilities should be permitted to buy a "fair share of public power" and there should be no more transmission facilities built where service can be supplied by nonfederal firms. Most of the commissioners gave dissents.

Intelligence—Intelligence activities need a continual "watch dog" system to check operations and expenditures, says the commission. This is needed for two reasons: 1. It will provide a thorough review of efficiency and effectiveness. 2. It would help inspire the nation's confidence in intelligence operations.

Washington Whisper

Behind the scenes, Secretary of the Treasury George Humphrey and Secretary of Commerce Sinclair Weeks are convincing themselves and others that the tax amortization program should be dropped. Their theory: The civilian economy should determine what expansion is needed.

Will WOC's Vanish?

The Senate Banking committee approved a two-year extension of the Defense Production Act and then started playing politics. Seven Democrats lined up solidly against seven Republicans to bar dollar-a-year men (WOC's) from serving in policymaking or key administrative positions in federal agencies. This would virtually kill the WOC program which brings men into government for a six month period. While in Washington, these men learn government operations and lend the government their industry knowledge. Reason given by the Dems for limiting businessmen's power: They should not handle government affairs in which their companies have an interest—direct or indirect. Sen. William Knowland, Republican floor leader and a member of the banking committee, has introduced an "amendment to the amendment" this week which would give WOC's the power to make decisions on industrial defense matters. This has always been the WOC's primary mission in government. Through the government program, hundreds of key industrial businessmen have been given basic training which would allow them to shoulder government positions in event of war.

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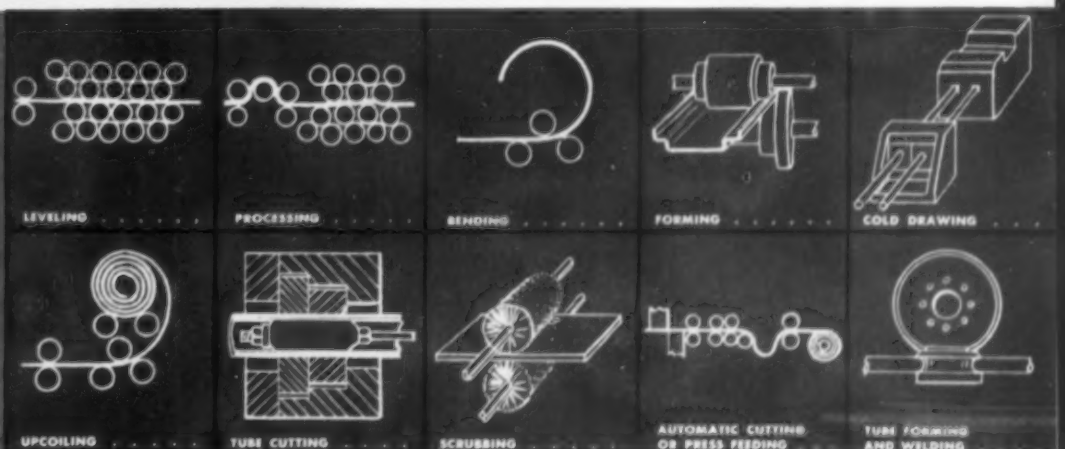

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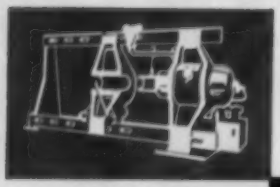
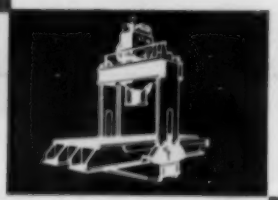


Inclined Forcing

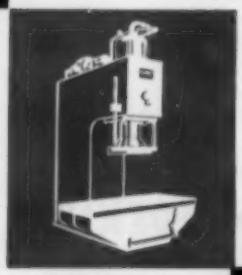


Traveling Head Straightening

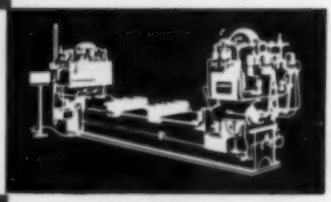
Drawing and Forming

If you're seeking improved and more economical press performance for your metalworking production, you can come with confidence to Elmes. Elmes builds a complete line of hydraulic presses for a broad range of metalworking jobs—for drawing and forming, coining, forging, hobbing, straightening, bending, forcing, powder metal compacting, etc. One of the many Elmes® standard press designs may fit your needs exactly. Or, if your requirements are special, you can rely upon Elmes "custom engineering" for the answer. Building presses to meet individual customer requirements is an important part of Elmes engineering service.

Elmes Presses are recognized throughout industry for their proven quality and dependability, backed by over a century of accumulated engineering experience. Whether your requirements are standard or special, it will pay you to contact your Elmes Distributor, or write direct. Recommendations and cost estimates supplied promptly without obligation.

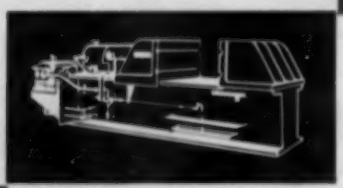


Openside C-Frame



Tube Reducing

Hobbing



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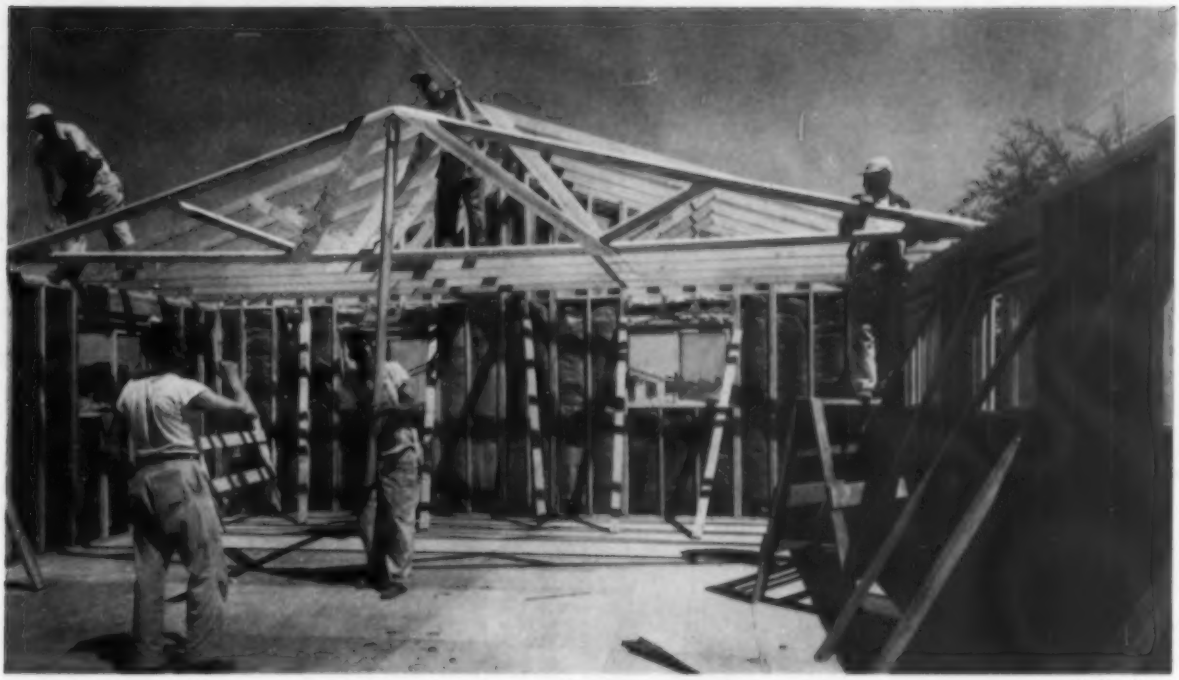


Modern Homes

"I'd like a practical metal door."

"A plumbing package would be welcome."

"Give us better built-in appliances."

"Steel's not competitive."

Builders' comments like these pose question . . .

Do You Fit in Prefab Picture?

By WILLIAM E. DEAN
Associate Editor

DON'T TAG the prefabricated home industry as small fry when you're appraising your potential market in home building. You can expect some industrial giants to emerge from the prefabbers' ranks in the next ten years.

They're applying the same mass production techniques you're using to turn out low-cost, quality homes for the weekly wage earner. For metalworking, the market potential provides a real challenge.

Take a Look — Take National Homes Corp., Lafayette, Ind. It's the nation's largest purchaser of plywood. If you could sell National Homes one item per home, you'd have a 25,000-unit sale for that one customer this year.

First quarter sales for the prefab home builders were up 50 per cent over 1954, compared with 22 per cent for home building over-all. The industry's 100 builders expect to manufacture 100,000 homes this year, about 10 per cent of the nation's single-family housing starts. Last year they accounted for about 7 per cent.

Pattern—Although they produce homes selling for up to $40,000, the prefabbers generally aim at the $12,000-and-under market. According to the Prefabricated Home Manufacturers' Institute, 25 per cent of prefab sales are for $8000-and-under homes, 50 per cent for $8000-to-$12,000 types.

The prefabricated home has taken its lumps in gaining public acceptance—some city building codes forbid their erection. But barriers are being beaten down, and prefabs are getting a bigger share of the market (see page 57). Here's why:

Promise—Homes are being designed by outstanding architects; builders are incorporating the latest technical developments; financing—once shunned by banks—is becoming easier.

Mass selling and distribution techniques are employed. National Homes has a fleet of 250 trucks. Delivery is scheduled to get the home on the building site at 8 a.m. so that the house shell and roof can be in place by quitting time that day.

Promotion—U. S. Steel Homes

Inc., subsidiary of U. S. Steel Corp., is featuring supermarket sales methods for 1100 homes it's building in a subdivision near Elgin, Ill. To do it, U. S. Steel Homes erected six model homes, a prefab motion picture theater and an office building. Customers will "shop" for their homes by visiting the models, see a 23-minute movie which will answer questions about utilities, shopping, schools, etc., then go to the office building ready to discuss location and financing. Forty deals can be closed in 3 hours.

Where do you fit in? STEEL contacted the leading prefab home manufacturers for some of the answers and found that many already are putting more metal in their product than you will find in conventionally built homes.

Markets—Modern Homes Corp., Dearborn, Mich., uses a steel truss-like system for its floor joists, and this year introduced a steel sound conditioning ceiling. Modern's research and development department is studying the possibility of metal roof trusses but "has yet to find a competitive source."

Many builders like Pease Woodwork Co., Hamilton, O., offer metal window units as an alternate to wood. Says John W. Pease: "We'd be glad to consider other metal applications such as sliding doors when they are practically designed and priced."

Metalworking—Officials of Thyer Mfg. Corp., Toledo, O., report they're considering metal louvers. At one time they tried a prefabricated plumbing package, but it was too complicated and didn't fit. They're still looking for a practical plumbing solution.

Another builder said he'd welcome a good metal door to relieve him of complaints about warping and veneer peeling.

Design—Just as in many conventionally built homes (see STEEL, Apr. 11, p. 65), appliances and steel kitchens are often part of the prefab home package. Prefabbers would like to see more built-in designed equipment for their homes. One complains that bath tubs often vary ½-in. or more

---

FEW SALESMEN ever sell themselves out of business. James R. Price, president of National Homes Corp., once did.

As a realtor he sold 40 homes in one month—a signal feat in Lafayette, Ind., in the prewar period. His problem: He ran out of homes to sell.

Contrast—Today, Jim Price builds houses on an assembly line at the rate of 115 daily. Sales are running 33 per cent ahead of 1954's. National Homes is shooting for a goal of 25,000 units this year.

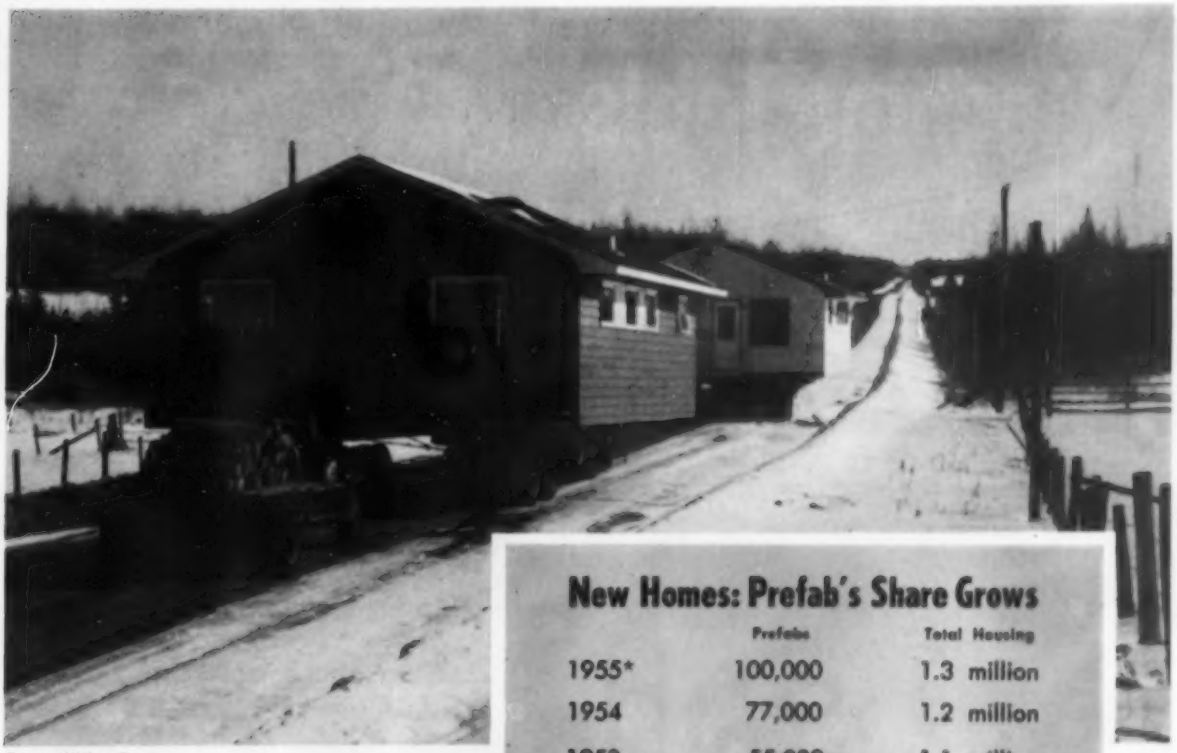
The real estate experience proved one thing to Mr. Price: There was a terrific market in the U.S. for a house that the weekly wage earner could afford. He turned carpenter and set out to build a bargain home in the conventional manner. It sold quickly; he lost $1600. But he was convinced of the mass market potential and that modern mass-production techniques were the answer.

First Cousins—From its start in 1940 on a $12,500 investment, National Homes has climbed to the nation's top position as a prefab builder. Its factories—one in Lafayette and one in Elmira, N. Y.—are not unlike any metalworking plant: Automatic machines cut, shape and drill wood; workers assemble the parts on a moving line; conveyors whisk the completed wall sections into waiting trucks for delivery next morning on the building site.

Like the auto in its infancy, prefab homes once drew more than their share of ridicule. "But," says mass builder Price, "the great and growing acceptance of assembly-line homes will bring major changes in the building industry in the next 20 years. It'll be just as strange for home builders in 1975 to use current conventional methods of construction as for them not to use prefabricated doors, windows and the other standardized items of today. Actually, prefabrication isn't new; we're just taking it further down the typically American road to standardized quality and lower cost."

Expansion—National Homes' expansion plans testify to Mr. Price's confidence in the industry's future. A 300,000-sq-ft addition is being completed at the main plant in Lafayette and a new plant is being erected in Tyler, Tex., to serve the Southwest.

When the expansion is completed, National Homes and Jim Price will have a daily production capacity of 290 homes—quite a contrast to the 40-home sales achievement that put him out of the real estate business.



Reserve Mining Co.

New Homes: Prefab's Share Grows

	Prefabs	Total Housing
1955*	100,000	1.3 million
1954	77,000	1.2 million
1953	55,000	1.1 million
1951	50,000	1.0 million
1949	35,000	1.0 million

Sources: Prefabricated Homes Mfrs. Institute
U. S. Bureau of Labor Statistics
*Estimated

in length and width. Modifications are necessary to make them fit in the allotted space.

Prefabbers' comments make it clear that their goal is to get the best possible home at the lowest cost. They're willing to substitute materials or products any time equal or better quality can be given at equal or lower cost.

Equipment—Don't overlook the manufacturing facilities as a possible market, too. Mass production of prefab homes requires automatic equipment, assembly lines, conveyors, paint booths and other equipment common in any metalworking plant. To date, most home builders have had to develop and build their own equipment.

Inland Homes Corp., Piqua, O., for example, recently developed an automatic stapling machine for shingles. In the last 18 months the company has eliminated 75 per cent of its direct labor costs through production line mechanization.

Outlook — Prefabbers are optimistic. Robert J. Lytle, president of Modern Homes, says the industry has a potential of a million homes by 1965. That's close to 60 per cent of all homes expected to be constructed. Metalworking's stake in that volume will depend upon the markets you start to develop today.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.*

Hotpoint Opens Factory

Hotpoint Co. formally opened its home laundry factory at 5660 W. Taylor St., Chicago. This marks completion of the company's expansion program aimed at doubling sales in ten years.

Air Conditioning: New Goals

Sales of central air conditioning for homes in the early months of this year have doubled those of last year.

Cloud Wampler, chairman and president, Carrier Corp., estimates that 150,000 central units will be sold this year. This is a rise of 25,000 units over an earlier forecast. He also states that by 1960 central air conditioning will be going into homes at a rate of over half a million units annually. Retail sales will reach $800 million, he predicts.

Aluminum Fabricator Building

Sunmaster Products Co. will build a $200,000 plant in Sunnyvale, Calif., to manufacture aluminum step ladders, extension ladders and allied aluminum products.

Cory Corp. Buys Building

Cory Corp., Chicago, manufacturer of home appliances, housewares and air treatment equipment, purchased a building containing 32,000 sq ft. It is adjacent to Cory's main appliance plant and will be used by the service department and for storage.

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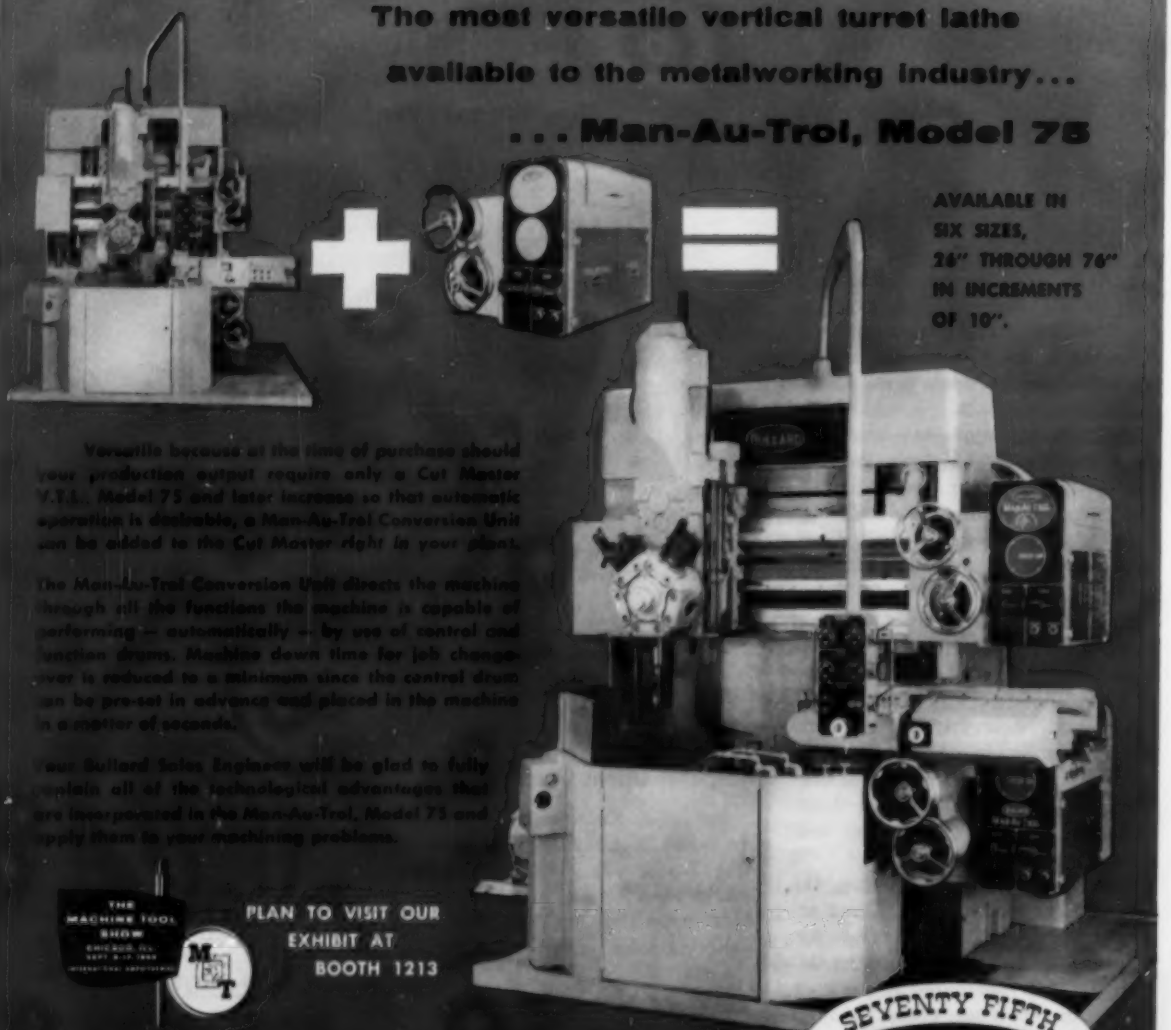

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Your Bullard Sales Engineer will be glad to fully explain all of the technological advantages that are incorporated in the Man-Au-Trol, Model 75 and apply them to your machining problems.

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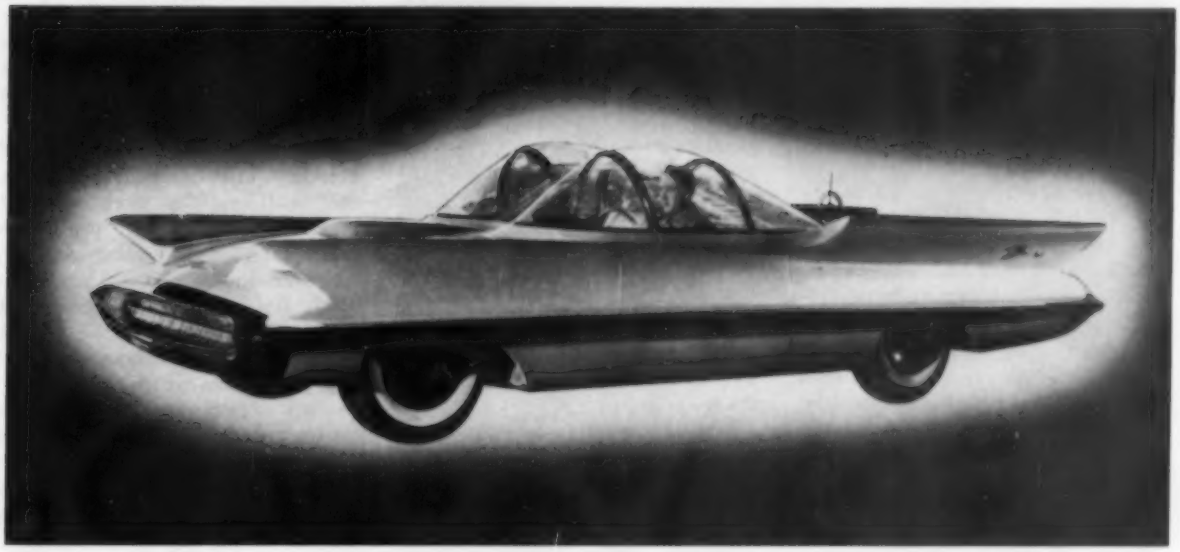

Lincoln Futura may set the style pace as . . .

Detroit Readies New Car Models

DON'T BET YOUR SHIRT on 1956 setting any records for the auto industry. That's because a record year couples the ability to buy with the desire to buy. Most observers agree that the economic climate in 1956 looks balmy, but the only breeze of desire stirring may be a slight Lincoln Zephyr.

This year importantly changed cars were introduced by Plymouth, Dodge, DeSoto, Chrysler, Chevrolet, Pontiac, Ford, Mercury, Packard, Hudson and Nash. Of the big three, only Lincoln, Cadillac, Buick and Oldsmobile did not have major changes and most of these undoubtedly benefited from the new car fever generated by the changed makes.

Few Big Changes—By contrast, 1956 will see only Lincoln with a new body and chassis. Nash Rambler will have important changes. In the limited volume field will be an all-new Continental and an all-new Eldorado brougham by Cadillac. There also will be a brand new Corvette. But none of these are the bread and butter type.

That's not to say that cars won't be changed plenty in 1956. More money is being spent on facelifts than any previous year in the industry. New quarter panels, hoods, grills and even lengthened rear decks are being introduced to keep the fever burning. New cars will be introduced much on the prewar pattern with one make bowing in late August, the bulk in September and October.

Will Public Buy?—The question is: Will buyers who can see a last year's car underneath consider the changes important enough to buy?

Take the matter of the four-door hardtop: Each of the big three will have the version in principal lines in 1956. General Motors Corp. jumped the gun on the industry in its B body series for an industry first, but all have had this style in the works for planned 1956 announcement. They didn't need it this year for they had plenty new without it.

Push Button Shifting—In the matter of transmissions, the GM "Whirlaway," a name which was going to be dropped because it suggested washing machines, will be on the cars now using Hydramatic. Buick reportedly will go to a transmission having twin variable pitch, a job that could be a step or two ahead of the Whirlaway. Other makes will offer mechanical improvement of existing designs and several makers are reported ready to offer push-button shifting.

It's hardly worth mentioning that the horsepower race will continue. Top dog in the industry seems likely to be Cadillac which will have a new block and an enlarged version of its already proved mill. This engine will displace about 363 cu in. and it's expected to deliver around 325 hp in the short track models.

Octane Ratings Up—A help to all automakers is a planned hike in the gasoline octane which will permit compression ratios of about 9.5 to one in overheads. Ethyl Corp. makes no bones about liking to sell its anti-knock red stuff but the firm may have to go into the alcohol business if some people don't get some new engines. Incidentally, it's going to be a dandy year for carburetors.

One of the most interesting engines will be that of the Nash Rambler, which will be a reworked

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Statesman job. In the rework, the L-head design will be made overhead for the intake valve only with the exhaust remaining in the block. Designers claim the breathing of this engine will be as efficient as a fully overhead job yet the cost will be low in contrast. But the $64 question: Will Packard continue to sell American Motors its heavy-stuff engines? Rumored to be going into the large Studebaker, the firm might find it needed all it could build and AM might be scrounging. Problems . . .

The Studebaker, incidentally, will be a really major facelift in 1956. Some of the sloped-off look will disappear and the car will be roomier though the same basic body will be retained with modifications. A good friend did the facelift and he says the major purpose will be to give more underhood room, at the same time re-emphasize the car's lower portion.

Match Your Suit — Colors also will be in great chaos again in 1956 with a trend to more pastels just exactly like women's and men's clothing fashions. The best response to the comment, "I just bought a new car" will still be "What color?"

Getting into styling, let's run through the makes with other incidental features as we go:

Eyes on Lincoln—Biggest industry impact will probably be the new Lincoln or the Eldorado brougham — not the new Continental. To those who loved the old Continentals, the new car lacks distinctiveness. It's easy to recognize, but it has lines from the Thunderbird, Packard and others. In fact, the best description is a scaled up Thunderbird with front and rear seats. The hood is very long and the car is 224 inches in length, only 56 inches high. The rear of the car is the most interesting portion, involving a couple of Packard-type tail lights and fins. The rear deck incorporates the integral Continental spare tire mounting and is set well in. In other words, the Continental mount is a bump set into the rear deck, and it's this observer's view that advertising will have to do for the new Continental what character of design did for the old one.

The Lincoln to many will be a more interesting car in styling's fight to the fin-nish. Evolving toward the Futura pictured on preceding page, the car couples a very long fender line with extremely low over-all height much like the Continental. Interiors are reported to really sing with space-ship atmosphere as the Ford Motor Co. begins to move on Cadillac with Packard.

Dream Car to Live—Cadillac will go with the current Eldorado tail fins on its 1956 passenger cars, a new and extremely wide grill and reworked front quarter panels. Parking lights are described as comparable to television screens as the standard goes still more massive to make people forget about the Rolls Royce.

Incidentally, the car with that specific mission in life may well prove to be the prettiest thing of the year. The Eldorado brougham is reported slightly revised over the show edition in a clean, airy car that has much of the distinctiveness Continental has always stood for.

$100 Million-Plus Look—Chrysler is spending a nice bit of change in a good solid face-lift that will be more important in appearance than previous face-lifts by the corporation though still recognizable as such. General effect will be pleasing with different portions of the already sculptured bodies emphasized by paint and chrome like the line below the rear deck of the Plymouth, for example, this year ignored. Push-button shifting on all but Plymouth, lengthened rear deck and major panel revisions on the Imperial, more luxurious interiors, higher horsepower and the like will complete the list.

All-New Ford in 1957—Ford and Mercury will have grill changes, etc., with new plus ultra tail light treatments. Those who are disappointed in these products next year, however, should plan on buying in 1957. It's quite safe to predict that the 1957 Ford will be the hottest thing on the road. It boasts a metal top convertible which converts by the top sliding under the rear deck lid and the most extreme tail fins since the Air Force hit on the Pogo plane. Low, futura-ish and highly powered, the 1957 Ford will be a car for Chevrolet to reckon with.

Chevrolet, Pontiac, Buick and Olds will pretty much go with facelifts though engineers have perfected a de Dion rear end for Buick and air suspension for all. The problem is that engineers aren't sure how near the things are to production and it could be either 1956 or 1957.

Big Push in 1957—On that score, it seems inevitable that 1957 is going to be the year to reckon with. Cars in 1956 together with facelifts will be marked with innovations like oil level indicators, limited slip differentials, push-button transmissions, more powerful engines and lots more paint. They will not shake the earth.

But in 1957, the lid is really going to pop in a manner to make 1955 look like a small ripple on the stream of progress. Improvements will be basic and important. But tell your enemies to buy cars in 1956—the auto firms are probably going to need the business. In 1957, they can take care of themselves.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994	676,269
May	913,249	621,318
June	903,000*	623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,885,066
Week Ended	1955	1954
June 4	163,731	119,688
June 11	172,794	139,312
June 18	178,475	140,063
June 25	191,890	140,695
July 2	195,034†	133,141
July 9	150,000*	106,169

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

New Approach for Turbines

A new policy directive covering the development of aircraft turbine engines has been approved by Charles E. Wilson, defense secretary. It recognizes that two engines with the same or nearly the same thrust rating may have entirely different design characteristics.

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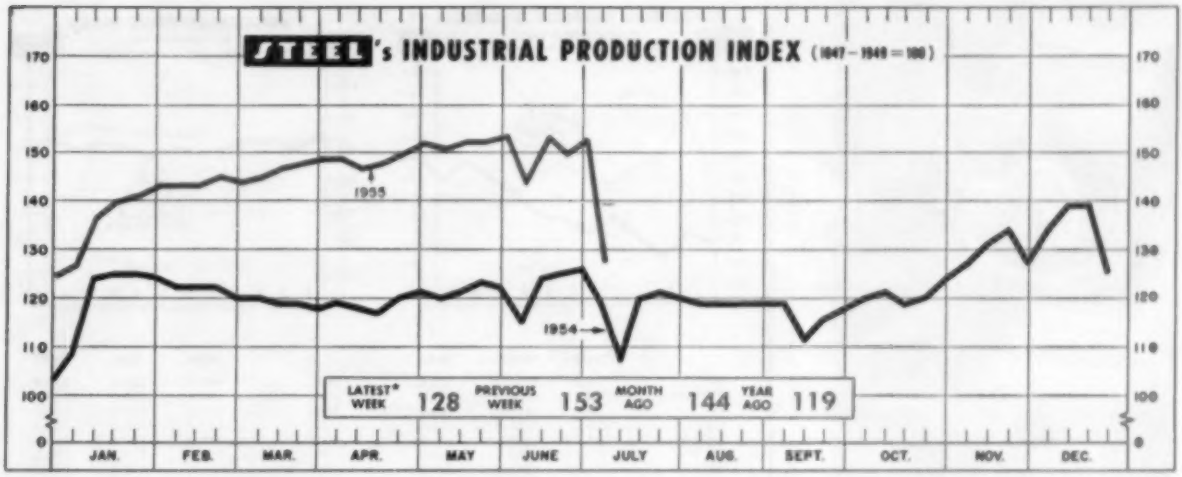
YEARS AHEAD — THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended July 2. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

Steel Shutdown Bites Into Production Index

IT WAS the shortest steel strike on record, but it bit deeply into STEEL's industrial production index shoving it down to 128, the lowest level since early January.

Adding to the drop-off were usual pre-holiday dips in electric power output and freight car loadings. Auto output showed a small gain as General Motors boosted schedules in response to company-wide labor peace for the first time in a month. Ford production fell as work was limited to five days to give workers a long week end. Chrysler and the Independents held outturn at about the previous week's level.

Predictions — More and more forecasts indicate good business in third quarter. It will definitely be better than a year ago, but the usual summer slowdown will take its toll, dropping most lines below second quarter totals.

The Regional Shippers Advisory Boards of the Association of American Railroads see business in third quarter up 10 per cent from a year ago. Particularly impressive gains are forecast for metalworking lines.

Increases — For example, the shippers expect car and truck shipments to be 44 per cent higher than last year; vehicle parts up 21 per cent; and agricultural implements up 19 per cent.

Also on the higher side are the primary metals and machinery and boilers. Pointing to a continuing good level of steel output is the prediction for a 30-per-cent increase, over a year ago, in shipments of ore and concentrates, one of the few categories expected to be up from second quarter.

Nationwide — Illustrating the broadness of business gains, compared with last year, is the estimate that 28 of the 32 commodities listed in the boards' forecast will show an increase. A year ago, the prediction was for 23 to show a decline.

All 13 of the boards say loadings will be up from last year. Estimates run from a 31-per-cent

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,164[1]	1,716	1,430
Electric Power Distributed (million kw-hr)	9,975[1]	10,226	8,825
Bitum. Coal Output (1000 tons)	9,600	9,600	8,288
Petroleum Production (daily avg—1000 bbl)	6,637[1]	6,626	6,510
Construction Volume (*ENR*—millions)	$439.1	$412.1	$323.9
Automobile, Truck Output (*Ward's*—units)	195,034[1]	191,890	133,141
TRADE			
Freight Car Loadings (1000 cars)	695[1]	799	619
Business Failures (Dun & Bradstreet, no.)	210[1]	205	192
Currency in Circulation (millions)[3]	$30,021	$30,035	$29,904
Dept. Store Sales (changes from year ago)[3]	+6%	+2%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,692	$22,829	$20,250
Federal Gross Debt (billions)	$273.8	$275.4	$270.5
Bond Volume, NYSE (millions)	$19.7	$20.6	$21.3
Stocks Sales, NYSE (thousands of shares)	11,541	13,525	10,267
Loans and Investments (billions)[4]	$84.4	$85.0	$80.7
U. S. Govt. Obligations Held (billions)[4]	$32.3	$32.8	$33.4
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.75
STEEL's Nonferrous Metal Price Index[6]	238.7	238.5	215.7
All Commodities[7]	110.0	110.3	109.9
Commodities Other than Farm & Foods[7]	115.7	115.7	114.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939 = 100. [6]1936-1939 = 100. [7]Bureau of Labor Statistics Index, 1947-1949 = 100.

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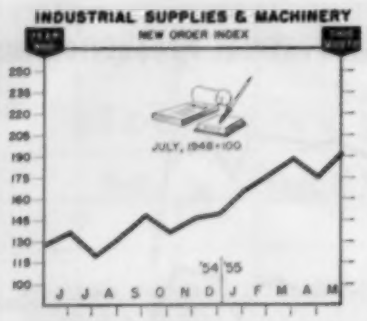
THE BUSINESS TREND



	1955	1954	1953
Jan.	164.4	139.8	157.4
Feb.	175.1	140.5	172.9
Mar.	166.9	141.5	166.2
Apr.	173.7	131.9	162.1
May	191.6	129.4	171.1
June	....	136.4	160.0
July	....	119.4	165.3
Aug.	....	122.5	139.6
Sept.	....	148.1	150.6
Oct.	....	136.3	146.0
Nov.	....	146.2	144.8
Dec.	....	146.8	136.7

Amer. Supply & Machinery Mfrs.' Assn.
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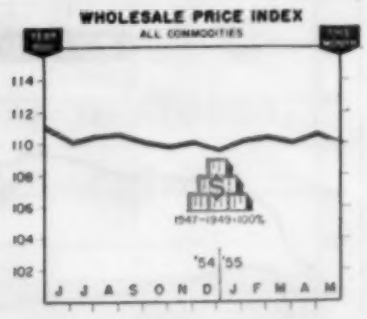


	1955	1954	1953
Jan.	110.1	110.9	109.9
Feb.	110.4	110.5	109.6
Mar.	110.0	110.5	110.0
Apr.	110.5	111.0	109.4
May	109.9	110.9	109.8
June	....	110.0	109.5
July	....	110.4	110.9
Aug.	....	110.5	110.6
Sept.	....	110.0	111.0
Oct.	....	109.7	110.2
Nov.	....	110.0	109.8
Dec.	....	109.5	110.1

U. S. Bureau of Labor Statistics.

gain in the Pacific Northwest and 21 per cent in the Great Lakes region down to 1.1 per cent. At this time in 1954, a decline was expected in all areas of the nation except the Pacific Northwest.

More New Orders Booked . . .

Reinforcing the shippers' estimates is an upturn in new orders. Manufacturers' orders in May were at the highest seasonally adjusted rate since January, 1951, says the Commerce department.

Biggest gain was in the durable goods field, up 12 per cent, with all major industry groups reporting increases from April. Backlogs rose $500 million; primary metals and transportation equipment firms took the biggest share.

Inventories showed a small rise, but not enough to make much difference in the over-all business picture. Mostly, it's a sign that industry is filling in weak spots in its stockpile.

Sales continue good. May turnover in durable goods was the same as April's on an unadjusted basis, but showed a $500-million gain when adjusted for seasonal variation. May sales were $13.3 billion, compared with $11 billion a year ago.

Laundry Appliances Gain . . .

Home laundry equipment producers got their share with factory sales for the month higher than in any other May in the industry's history.

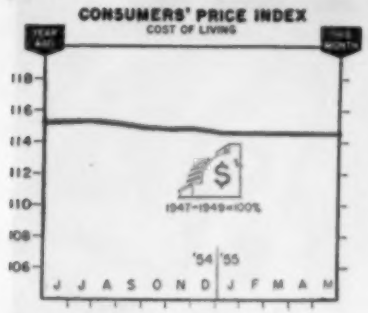
American Home Laundry Manufacturers' Association reports shipments of 397,545 washers, dryers and ironers. That's 42 per cent greater than in May of last year and 2 per cent above the previous record set in 1948.

Radio and television output also moved well ahead of last year. Thus far in 1955, 41 per cent more TV sets and 44 per cent more radios have been turned out. TV showed its usual seasonal decline in May, falling to 467,394 from 583,174 in April. Last May production was 396,287.

Radio may be making a comeback. Output moved against the seasonal downturn, and 1,114,035 sets were turned out, compared with 1,099,775 in April. A year ago production was only 722,104.

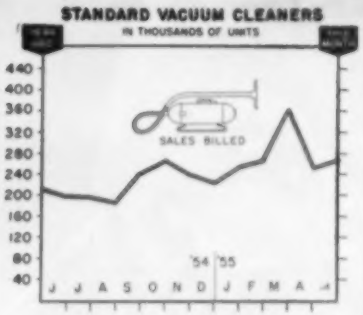
Building Climbs Higher . . .

Heavy construction keeps rushing ahead toward its best year in history—almost 20 per cent ahead of 1953, the former record year,



	1955	1954	1953
Jan.	114.3	115.2	113.9
Feb.	114.3	115.0	113.4
Mar.	114.3	114.8	113.6
Apr.	114.2	114.6	113.7
May	114.2	115.0	114.0
June	....	115.1	114.5
July	....	115.2	114.7
Aug.	....	115.0	115.0
Sept.	....	114.7	115.2
Oct.	....	114.5	115.4
Nov.	....	114.6	115.0
Dec.	....	114.3	114.9

U. S. Bureau of Labor Statistics.



Sales Billed—Units

	1955	1954	1953
Jan.	250,123	221,233	255,886
Feb.	262,651	199,035	246,007
Mar.	358,179	276,464	329,294
Apr.	244,143	220,849	268,548
May	261,238	209,434	252,404
June	.....	195,781	197,506
July	.....	193,607	159,446
Aug.	.....	185,397	188,536
Sept.	.....	238,235	227,253
Oct.	.....	263,197	249,383
Nov.	.....	237,882	216,227
Dec.	.....	217,022	190,773
Total	.....	2,658,136	2,781,263

Vacuum Cleaner Mfrs. Assn.

says the latest report by *Engineering News-Record*.

The 26-week total is $9242 million worth of contract awards. It tops last year by 38 per cent.

Private building in the last week of June was highest ever for a week in that month. Commercial building was just a shade off the record week of last March. Housing projects and industrial building continue strong.

Public works had a good week, sparked by $110 million in state and local awards, and the best week of the month in Federal work, $51 million. Highways wound up their biggest month in history.

Costs Go Up, Too . . .

But like volume, costs are going up. Austin Co., Cleveland, pegs second-quarter building costs at 195 per cent of the 1926 average.

"On top of wage increases in almost every category, prices of all but two of the major construction materials included in our index have now gone up from 2 to 10 per cent," says George A. Bryant, president of the engineering and construction firm.

"With the general advance in steel prices ahead, a further increase in third quarter appears to be inevitable," he adds.

Trends Fore and Aft . . .

New orders reported by members of the Resistance Welder Manufacturers' Association were up 32 per cent in May compared with the same month a year ago. Shipments were up 24 per cent . . . Fabricated structural steel bookings in May were highest in two years, reports American Institute of Steel Construction. This May's totals were 53 per cent above the same month of 1954. Shipments, though, are lagging to bring about a growing backlog—1,592,384 tons against 1,489,662 tons last year . . . Gear sales in May were best since late 1953. Volume was up 14.1 per cent from April and more than double the 1947-1949 average, says American Gear Manufacturers Association . . . There were 375 strikes started in May, the lowest number for any May since 1948, notes the Labor department. In May, 1953, for example, almost 600 began. The effect of recent auto labor flare-ups won't be noticed until June figures come out . . . Department store sales to date are 6 per cent ahead of a year ago.

Don't junk your old lathe just because it has begun to chatter and shake.

Now is the time to have your outdated machine tools returned to their original performance levels through Simmons Engineered Rebuilding—at half the cost of new equipment.

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A wide variety of types and sizes of tubular-type SPEED CLIPS are used on everything from toys to autos—on metal, plastic or wood. They snap into punched or molded holes by hand; are self-retained in stud-receiving position. SPEED CLIPS are also ideal for blind attachments where only one side of an assembly is accessible.

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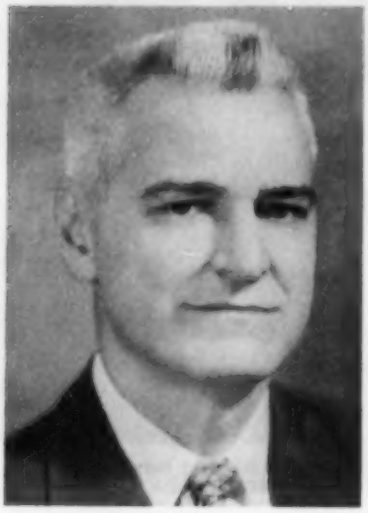


NORBERT K. KOEBEL
. . . Lindberg Engineering div. mgr.

FRANK BRECKENRIDGE
. . . heads Globe Hoist manufacturing

ROBERT W. PHILLIPS
. . . Flex-O-Tube chief engineer

Norbert K. Koebel was made manager, heat treating furnace division, **Lindberg Engineering Co.**, Chicago. In addition to directing research and development, he will supervise technical sales, application engineering of heat treating processes and equipment and will be chief technical adviser to associate companies in Europe and the Orient.

Goff Smith was elected executive vice president of Griffin Wheel Co., a subsidiary of **American Steel Foundries**, Chicago. He is succeeded by **Roger G. Kimber** as manager of railway specialties sales for the parent company.

James W. Foley was elected executive vice president of **The Texas Co.**, New York.

Allegheny Ludlum Steel Corp., Pittsburgh, appointed **C. R. Mitchell Jr.** manager of stainless steel sheet sales to replace **T. B. Brown**, resigned. Mr. Mitchell's new title will be product manager, stainless sheets and strip.

Edward C. Gits was elected vice president-seal division, **Gits Bros. Mfg. Co.**, Chicago.

J. Walter Gulliksen, general manager, was elected vice president of **Waterbury Mfg. Co.**, division of Chase Brass & Copper Co., Waterbury, Conn.

Frank Breckenridge was named vice president in charge of engineering and manufacturing for **Globe Hoist Co.'s** three plants at Philadelphia, Des Moines, Iowa, and Long Beach, Calif. He also was elected a director. Before joining Globe, Mr. Breckenridge was president and general manager of Automatic Washer Co. He will have headquarters in Philadelphia.

John C. Molinar succeeds **W. E. Loy** as general sales manager, **Union Twist Drill Co.**, Athol, Mass. Mr. Loy, because of ill health, asked to be relieved of that part of his duties but continues as treasurer. Mr. Molinar was formerly vice president, general sales manager and director of Niles-Bement-Pond Co., in charge of sales activities of its Pratt & Whitney Division.

Elton S. Moyer was made assistant chief engineer, **Moraine Products Division**, General Motors Corp., at Dayton, O. He was assistant chief engineer of the Cadillac tank plant in Cleveland.

Walter E. Schutz was made sales manager of **Yates-American Machine Co.'s** new power tool division at Beloit, Wis.

Charles R. Wilson Jr. was named manager of quality control at **Brubaker Electronics Inc.**, Los Angeles.

Robert W. Phillips was appointed chief engineer, **Flex-O-Tube Division**, Meridan Corp., Inkster, Mich. He is responsible for product engineering, research and development activities. He formerly was chief engineer of the Weatherhead Co.

Willard L. France, former manager of the Rochester, N. Y., aircraft parts plant of **A. O. Smith Corp.**, was made general manager of the firm's Pacific Coast Works at Los Angeles. He succeeds **F. A. Henry**, resigned for reasons of health.

Chrysler Corp. appointed **J. C. Poyner** assistant general purchasing agent in charge of raw materials. For the last eight years, as divisional purchasing agent, he supervised procurement of steel and other raw materials. **Harold C. Cook** was made purchasing agent for the Dodge Division.

Clyde M. Williams becomes general manager of **National Steel Products Co.**, Houston, subsidiary of National Steel Corp. He succeeds **N. A. Fitch**, retired. Mr. Williams has been sales manager since 1954.

William S. Rheem II, general manager, **Rheem Mfg. Co.**, Chicago, was elected a vice president and a director.

John R. Bartizal was elected chair-

THOMAS TROWBRIDGE
. . . Behr-Manning asst. gen. sales mgr.

HARRY L. SMITH JR.
. . . Alcoa sales vice president

THOMAS DeLUTIS
. . . National Electric Products post

man of **Benjamin Electric Mfg. Co.**, Des Plaines, Ill.

Thomas Trowbridge was named assistant general sales manager, **Behr-Manning Division**, Norton Co., Troy, N. Y. **William J. Bennett** was made sales manager, eastern region, and **Victor F. Perreault** was appointed industrial trades manager.

Neil E. Kile was made manager of the Clinton, Mass., plant of **Colorado Fuel & Iron Corp.** He is succeeded as sales and product manager of the mechanical specialties department by **Ralph W. Ramer.**

Leland-Gifford Co. appointed **Malcolm Roberts** its Cleveland district sales manager.

Jack D. Bateman was made manager of market research, **Rockwell Mfg. Co.**, Pittsburgh. He succeeds **A. Clark Daugherty,** who was assigned other market research duties in over-all supervision.

Howard W. Bennett was made marketing consultant, gear-motor planning study, **General Electric Co.** He is at Fort Wayne, Ind.

Timken Roller Bearing Co. appointed **L. H. Gegenheimer** Cleveland district manager to replace **J. W. Weir,** retired, and **D. O. Scheetz** as assistant district manager. **R. L. Williams** was made manager of a new Columbus, O., district office, and **B. C. Price** district manager at St. Thomas, Ont.

Harry L. Smith Jr. was elected a sales vice president of **Aluminum Co. of America,** Pittsburgh. Among his new duties, Mr. Smith will direct the New Kensington, Pa., and Cleveland sales development divisions and the company's division of commercial research.

Ungar Electric Tools Inc., Los Angeles, named **Alvis R. Knowles** director of manufacturing and **Leon B. Ungar** director of sales and marketing.

Maximilian B. Bauer was elected a director and made vice president of **Diesel Energy Corp.**, New York.

D. A. Beckenbaugh was appointed division manager of general sales of **J. I. Case Co.**, Racine, Wis. **Carl S. Steward** was named works manager at the Rockford, Ill., plant.

J. E. Hunter was made purchasing agent and **S. K. Stynes** superintendent of material control for **Pace Corp.**, Base Line, Mich. **R. Sobodosh** was added to the Detroit area sales staff.

Robert P. Gira, former sales manager, Diversified Metal Products Inc., was appointed sales manager of **Topp Industries Inc.**, Los Angeles.

Joy Mfg. Co. appointed **L. G. Felderman** sales manager, rock mechanization, with headquarters at the Franklin, Pa., plant. He was sales engineering manager for all Franklin products.

Thomas DeLutis was made chief wire and cable engineer at **National Electric Products Corp.**, Pittsburgh. He is responsible for design and production.

Gen. Benjamin W. Chidlaw, U. S. Air Force, ret., joins **Thompson Products Inc.**, Cleveland, as a vice president.

John W. Spoor was made general sales manager, **Power Products Corp.**, Grafton, Wis. He was assistant general manager, welding division, A. O. Smith Corp.

Paul E. Beattie was elected vice president and general manager, **O & M Machine Co. Inc.**, Los Angeles. **Don Parkin** was elected vice president-sales.

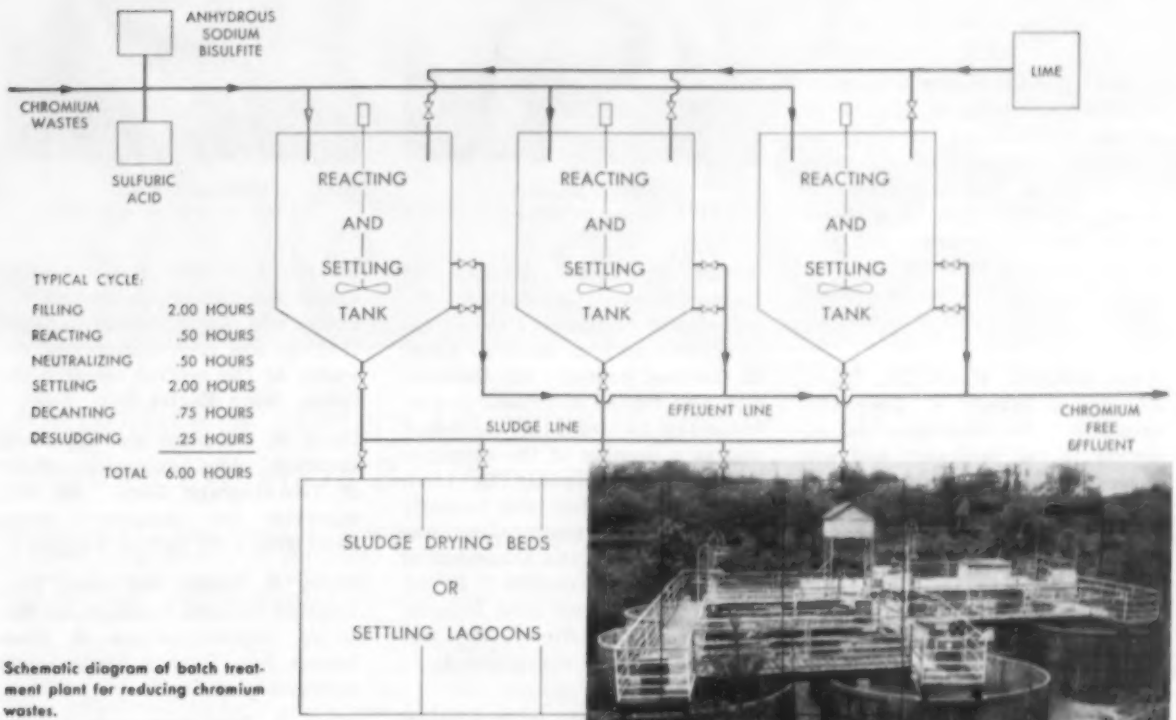
Richard Hodgson was elected a vice president of **Fairchild Camera & Instrument Corp.**, Syosset, N. Y. He also was promoted from trend planning director to general manager of the reconnaissance systems division.

Clesson H. Wiles was appointed purchasing agent and **John M. Whalen** assistant purchasing agent for **Duluth, Missabe & Iron Range Railway Co.**, Duluth. Mr. Wiles succeeds **Hugh Greenfield,** retired.

George E. Alter Jr. was made manager of **Jones & Laughlin Steel Corp.'s** Blair Limestone Division, Martinsburg, W. Va. He succeeds **T. J. McCarthy,** retired. At the container division, New York, **Torben**

FOR EFFECTIVE, ECONOMICAL CHROMIUM WASTE DISPOSAL

...use General Chemical's Anhydrous Sodium Bisulfite



Schematic diagram of batch treatment plant for reducing chromium wastes.

Batch plant giving efficient removal of chromium waste at the Electrolux Corporation, Old Greenwich, Conn.

Toxic chromium wastes are simply yet effectively and economically treated and neutralized when you use General's Anhydrous Sodium Bisulfite. And it doesn't matter whether the volume to be treated is large or small! Learn the full facts and details . . . call General Chemical's nearest office for skilled assistance and helpful Technical Service in solving *your own* particular problem.

General Chemical has a broad, *practical* knowledge in planning chromium waste installations gained the country over. This knowledge is *yours*—without cost or obligation! For a start—get General Chemical's helpful *free* booklet on the treatment of chromium wastes. It offers sound information on the type of disposal system required, quantities of chemicals involved, operation and control of the system, etc.

Allied Chemical

Write for free booklet today!

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Gentlemen:

☐ Please send me at no cost or obligation your free booklet, "Treatment of Chromium Waste Liquors with Anhydrous Sodium Bisulfite."

☐ Please have your representative call.

Name_____

Position_____

Company_____

Address_____

ST-7

Humie was made assistant sales manager.

John C. Ferguson was made assistant to the president of **Superior Steel Corp.**, Carnegie, Pa., dealing with administration of legal and other allied corporate affairs.

Paul Fenwick was made northeastern sales manager, **Marion Power Shovel Co.**, with headquarters in New York. **Walter Pierson** was made southeastern sales manager with headquarters in Atlanta.

J. Richard Milliken joined the metallurgical development division of **Climax Molybdenum Co.** at Pittsburgh as a specialist on the process industries and petroleum refining. He was with U. S. Steel Corp. **Herbert Geittman Jr.**, previously foundry manager of Richmond Foundry & Mfg. Co., joined the division as a cast iron specialist.

Elgin National Watch Co., Elgin, Ill., named **Harold E. Corr** vice president. He continues as assistant to the president, and will supervise the purchasing department and abrasives division, as well as co-ordinate watch manufacturing and marketing.

Robert J. Koch was made field sales manager for **Morse Chain Co.**, Ithaca, N. Y. He was Houston district sales manager.

Edward Gray was named an assistant chief engineer in charge of production engineering at **Chevrolet Motor Division**, General Motors Corp., Detroit. He succeeds **C. W. Fredericks**, now director of engineering at Detroit Diesel. For the last year, Mr. Gray directed Chevrolet's activities at the GM Proving Ground, and is succeeded by **Nelson E. Farley**, director of the Vehicle Development Group.

GIFFORD V. LEECE
. . . heads Gardner-Denver exec. committee

HOWARD J. FINDLEY
. . . asst. dir.-engineering at Eaton

Gifford V. Leece, president of **Gardner-Denver Co.**, Quincy, Ill., was elected chairman of the executive committee to succeed **Ralph G. Gardner**, retired. Mr. Gardner, who also retired as treasurer, continues as chairman of the board and as a member of the executive committee. **Alexander G. Lindquist**, vice president and formerly secretary and comptroller, was named treasurer and a member of the executive committee. In addition, he was made chief financial and accounting officer. The post of comptroller is discontinued.

Carl J. Gilson was made aviation sales manager of **A. A. Metal Products Inc.**, Los Angeles.

Ralph DuPree was named chief engineer of **Texton Corp.**, San Diego, Calif.

Francis L. Dabney, assistant secretary and assistant treasurer, **Bullard Co.**, Bridgeport, Conn., was elected a director.

Howard J. Findley was made assistant director of engineering for **Eaton Mfg. Co.**, Cleveland. Since 1941, he has been manager of research at the central research division, South Euclid, O.

David M. Goodman was appointed assistant chief executive officer of **TelAutograph Corp.** He will supervise the company's move from New York to Los Angeles.

Harry A. Ronan was made New England regional manager for **Motorola Communications & Electronics Inc.** He has headquarters at Winchester, Mass.

Alvin S. Baer was made general manager, building products division, **L. Sonneborn Sons Inc.**, New York.

Ipsen Industries Inc., Rockford, Ill., appointed **Robert Krogh** sales manager.

W. H. Lee was made manager of government sales and contracts for **Electric Products Co.**, Cleveland.

OBITUARIES . . .

Roy L. deBrauwere, assistant vice president, **Scovill Mfg. Co.**, and assistant general manager of the A. Schrader's Son Division, Brooklyn, N. Y., died June 18.

Richard Sees Jr., 43, who formerly was associated with his father, the late Richard Sees Sr., in the operation of **Capitol Brass Foundry**, Albany, N. Y., died June 21 in Glendale, Calif.

John W. Porter, former president of **Alabama By-Products Co.**, died recently in Birmingham.

Herbert L. Edinger, 61, president, **Barnett Foundry & Machine Co.**, Irvington, N. J., died June 26. He formerly was president of the Gray Iron Founders' Society.

Charles M. Grey, president, **C. M. Grey Mfg. Co.**, East Orange, N. J., died June 21. He founded the diecasting firm in 1910.

W. T. Koken, 76, chairman, **Banner Iron Works**, St. Louis, died June 21.

PHOTO COURTESY HARNISCHFEGER CORPORATION, MILWAUKEE, WISCONSIN

Flexibility of Modern Chrysler High-Speed Industrial Engines Proved in 375 Ampere Arc Welder

Here pictured in construction is a New York City garbage disposal dump located on the North River near 135th Street. When completed, trucks will drive up its ramps and discharge loads into cubicles located over scows. Scows will then convey refuse to a watery grave.

On this job, three P&H WN-302 Arc Welders have been putting in five 8-hour days every week welding cubicles, not only joining steel members but also giving them added strength for years to come. Chrysler Ind. 30 Engines power Harnischfeger 375 Amp. Welders supplying enough extra power to compensate for possible generator loss and still provide reserve for overload.

Within their 230 to 413 cubic inch displacement range, Chrysler Industrial Engines offer the high-speed performance construction equipment demands. Each engine is a compact, relatively small unit which will permit installation in virtually any type of construction equipment regardless of size or silhouette. Besides size, weight and cost advantages, should it become necessary, Chrysler Industrial Engines offer fast, easy parts replacement service with dealers located all over the country.

In considering power for your equipment, remember Chrysler offers its industrial engines built to meet the needs of the equipment with such items as gyrol Fluid Coupling; Chrysler Industrial Torque Converter; 3-, 4- or 5-speed transmissions; heavy-duty clutch and power takeoff; velocity, belt or gear-driven governors; gas, butane and propane burning carburetors available for factory installation.

With Chrysler Power too, you do not pay a premium. Production-line methods adapted to specialized industrial engine building provide a custom-built Engine at mass-production prices. See a Chrysler Industrial Engine Dealer or write: ***Dept. 87, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

CHRYSLER INDUSTRIAL 30 Engine
230 cubic inch displacement

CHRYSLER ***Industrial Engines***

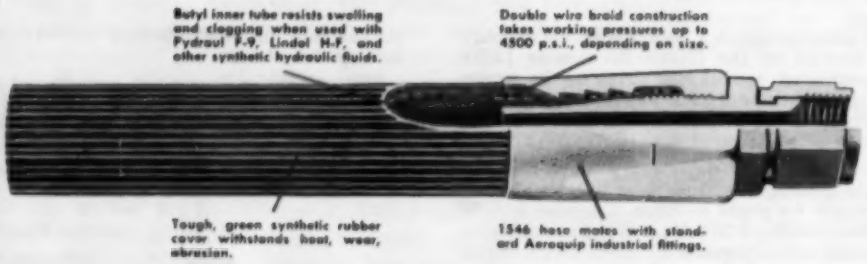
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

HORSEPOWER WITH A PEDIGREE

AGRICULTURE • INDUSTRY • CONSTRUCTION • OIL FIELDS

Reduce Fire Hazard!

New! Aeroquip 1546 High Pressure Hose for FIRE-RESISTANT Hydraulic Fluids


Butyl inner tube resists swelling and clogging when used with Pydraul F-9, Lindol H-F, and other synthetic hydraulic fluids.
Double wire braid construction takes working pressures up to 4500 p.s.i., depending on size.
Tough, green synthetic rubber cover withstands heat, wear, abrasion.
1546 hose mates with standard Aeroquip industrial fittings.

Highly recommended wherever hydraulic lines are used in plant "hot spots" are the new synthetic, fire-resistant hydraulic fluids. Aeroquip's new 1546 hose has been specially developed to carry these synthetic fluids without swelling or clogging.

The money-saving opportunities are immediate, because increased plant safety means reduced fire insurance premiums in many instances.

Other Aeroquip advantages: 1546 hose mates with standard Aeroquip reusable fittings. Hose assemblies can be made by your own personnel, right in your plant. A small inventory of bulk hose and fittings can meet your replacement line needs. And Aeroquip flexible hose can be installed in a fraction of the time required to form and fit rigid tubing. Write for complete information.

REG. TRADEMARK

Aeroquip

AEROQUIP CORPORATION, JACKSON, MICHIGAN

LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U.S.A. AND ABROAD • AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

Fisher Body Expanding

Extensive enlargement of stamping facilities and new tooling are included in program

GENERAL MOTORS CORP., Detroit, will add more than 4.5 million sq ft to Fisher Body's present 21 million sq ft of facilities, says James E. Goodman, vice president of GM and general manager of the Fisher Body Division. This is part of GM's $500-million capital expenditure program announced recently by Harlow H. Curtice, president.

Included in the program are new stamping plants at Mansfield, O., and at a site yet to be determined. Each will contain 1,776,000 sq ft of floor space. Another 970,000 sq ft of new construction will be added to seven existing plants. The program also calls for extensive new tooling and modernization of facilities.

More Stampings—Conversion of Fisher Body's medium tank plant at Grand Blanc, Mich., to a stamping plant is part of the program. This plant, containing 1.2 million sq ft, will be expanded 384,000 sq ft. It completes its defense contract in August.

Fisher Body plant No. 21 in Detroit, formerly used for process development activities now done at the General Motors Technical Center, will be converted to an assembly plant for special body lines.

Plants scheduled to receive new construction and modernization are in Atlanta; Baltimore; Los Angeles; St. Louis; Norwood, O.; Lansing and Grand Blanc, Mich.

Plants included in the modernization program are in Oakland, Calif.; Terrytown, N. Y.; Detroit and Pontiac, Mich. This is in addition to a modernization program completed at the Fleetwood plant in Detroit and those nearing completion at Janesville, Wis., and Kansas City, Mo.

Tool Manufacturers Merge

A. Landau Co. and Louis A. Sgro Co., two Philadelphia manufacturers of diamond-pointed tools, have merged. Officers of the new company, A. Landau Co., are Herman E. Landau, president, and Louis A. Sgro, vice president. Headquarters are at 247 S. 9th St., Philadelphia 7, Pa.

Alcoa Gets Berkeley Outlet

An additional source for aluminum products made by Aluminum Co. of America, Pittsburgh, opened on the West Coast July 1. Ducommun Metals & Supply Co. inaugurated a warehouse at Berkeley, Calif. The firm has been distributing Alcoa products in Los Angeles and San Diego, Calif., and in Phoenix, Ariz., since 1947. Pacific Metals Co. Ltd., San Francisco, with branch warehouses in Los Angeles and Salt Lake City, Utah, also is an Alcoa distributor in the region.

Dixie Electrical To Build

Dixie Electrical Mfg. Co., a new concern, is building a $1-million plant in Birmingham for the manufacture of distribution and pole line hardware, and electrical switch and outlet boxes. Other items will be added later.

Westinghouse Erecting Plant

Westinghouse Electric Corp., Pittsburgh, will build a highly automatic manufacturing plant at Youngwood, Pa., near Greensburg. Scheduled to be completed by late 1955, it will manufacture semiconductor devices, such as transistors, power rectifiers, high frequency detectors and photocells. It will be operated by the newly formed semiconductor department, managed by L. R. Hill. Other department officials include Dr. S. J. Angello, manager of engineering; Dr. L. L. Friend, manager of manufacturing; W. L. James, manager of sales; C. H. Hildebrand, purchasing agent.

Connors Steel Expanding

H. K. Porter Company Inc.'s Connors Steel Division, Birmingham, has started construction under a $2.5-million expansion program. The project will center on a new electric furnace (capacity 30,000 tons) and facilities to produce cold-drawn steel. Upon completion of the work, Connors will have four electric furnaces with an annual capacity of 140,000 tons of steel. The company completed another $2.5-million expansion two years ago, increasing capacity from 80,000 to 110,000 tons.

Tiny Motor Does Big Job

This dime-size gyroscope motor will get plenty of use on the moving antenna of aircraft fire-control radar. Designed by Westinghouse Electric Corp., the two-phase, 400-cycle synchronous motor operates on less than a volt per phase and revolves at 8000 rpm. The gyroscope measures angular movement of the antenna, enabling computers to coculate firing data

Plans Slag Processing Plant

Waylite Corp., Chicago, will build a blast furnace slag processing plant, costing $500,000 to $600,000, on a site owned by U. S. Steel Corp. in that district. The plant will be in operation by Mar. 1 and will use about 300,000 tons of molten slag a year.

American Zinc Widens Interests

American Zinc, Lead & Smelting Co., St. Louis, purchased nearly 15 per cent of the common stock of the newly formed Uranium Reduction Co. and has contracted to manage that company. Uranium Reduction will construct a large uranium processing mill at Moab, Utah. It will explore and develop certain mining claims in southern Utah. Howard I. Young, president, and Richard A. Young, vice president of American Zinc, will be directors and executive committee

(Please turn to page 76)

GET EXTRA SUB-HEARTH

SAFETY AND LONGER LIFE

WITH KAISER PERICLASE D-S BRICK →

THIS superior brick has been *especially designed* to withstand sub-hearth conditions. Thus, it gives maximum protection against costly breakthroughs and provides longer sub-hearth life.

Steel men agree on the important properties for a sub-hearth brick. They are all found in Kaiser Periclase D-S Brick.

High MgO (more than 95%) is achieved through the use of pre-shrunk, accurately sized Periclase grains derived from sea-water magnesia. Absence of chrome eliminates the reduction of chromium oxide and damage to the refractory structure.

Low iron content minimizes refractory damage from alternate oxidation and reduction of iron oxide and other iron compounds. Absence of calcium oxide prevents damage caused by slaking during slow heat-ups or while furnace is idle.

With all its many advantages, Kaiser Periclase D-S Brick gives you the ultimate in sub-hearth safety and durability—*yet costs no more!*

Call or write Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, California . . . First National Tower,* AKRON *8, Ohio . . . 518 Calumet Bldg., 5231 Hohman Avenue, Hammond, Indiana* (CHICAGO).

For the ultimate in steel furnace refractories . . .

Kaiser PERICLASE Brick for the Steel Industry:
• Kaiser Periclase D-S Brick • Kaiser Periclase Chrome Brick • Kaiser Chrome Periclase Brick
Now available! A companion mortar for Kaiser D-S Brick. High purity periclase composition and maximum workability.
INSTALLATION ADVICE ON REQUEST

think of Kaiser Chemicals

Pioneers in Modern Basic Refractories

CHEMICALS KAISER REFRACTORIES

Refractory Brick, Ramming Materials, Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite

CHICAGO TRAMRAIL

TRAK-RAK cuts cost of

BAR STOCK HANDLING 66.3%

employing 2 men where 4 were formerly required . . . with 100% selectivity of material

An improved, simplified, and radically different method of handling bar stock is now in use which replaces the usual difficult and costly method of storing bar stock in pigeon hole racks and removing only a bar or two at a time.

Utilizing the TRAK-RAK Crane System, bar stock is assembled in unit loads placed in containers or baskets which are stored in fabricated tree-type racks on each side of narrow aisles. To remove one or more bars, the container is lowered to the floor, the bars removed and the container with the remaining bar stock placed back in its designated location in the storage racks. The entire movement is one-man, pendant push-button controlled from the floor and it is now possible for the saw man to select his own material and place it directly upon the saw table.

This TRAK-RAK Crane System operates in a 4 ft. 6 in. aisle and stores the material eleven high. The same crane incorporates interchangeable forks which allows the crane to handle palletized material as well as bar stock in the same area.

Write today for TRAK-RAK applications —a 20-page illustrated booklet explaining the TRAK-RAK Handling and Storage System; illustrates and describes installations for handling many diverse materials in fourteen widely different industries.

CHICAGO TRAMRAIL CORPORATION

1326 SO. KOSTNER AVENUE • CHICAGO 23, ILLINOIS

(*Concluded from page 73*)

members of the new company. As executive vice president of Uranium Reduction Co., Richard Young will be in charge of construction, operations and finances. Total capitalization of the company will be $12 million. About $8 million will be used for construction of the milling plant.

Wire Producer Expanding

Reid-Avery Co. Inc., Dundalk, Baltimore, is installing three coiling machines of its own design, a continuous electrolytic copper plating machine, a Trauwood continuous annealing line and is modernizing parts of the wire drawing facilities which include Vaughn continuous, 6-pass machines. This equipment is expected to increase production of all types of alloy and specialty wires in addition to low-alloy and mild-steel grades of rewound coils for automatic welding.

Castings Producers Merge

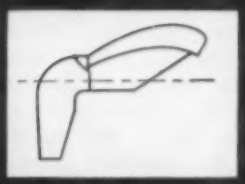
Michigan Steel Casting Co., Detroit, purchased Standard Alloy Co., Cleveland, and is moving the latter's operations, patterns and certain production personnel into the larger plant at Detroit. Name of the consolidated firm is Michigan-Standard Alloy Casting Co. which operates as a division of Consolidated Foundries & Mfg. Corp., Wilmington, Del. (STEEL, Mar. 21, p. 101).

Sept Isles To Join Ore Fleet

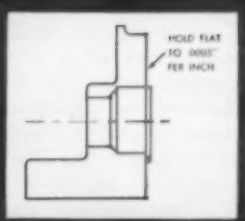
The first of two ore carriers being built for the Iron Ore Transport Co. Ltd. was launched June 22 at the yard of the Furness Shipbuilding Co. Ltd., Haverton-Hill, Billingham, on the river Tees in England. The vessel was christened *Sept Iles* by Mrs. Robert S. Walker, wife of M. A. Hanna Co.'s consulting engineer. Partners in the Iron Ore Transport Co. are Wheeling Steel Corp., Armco Steel Corp., Hanna Coal & Ore Corp., National Steel Corp. and Youngstown Sheet & Tube Co.

The vessel will be in the iron ore trade between Sept Iles, Que., and Atlantic ports in the United States. General dimensions are:

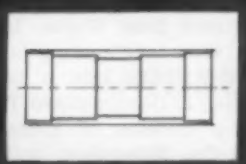
Setup and Tooling Costs ON THE HOUSE



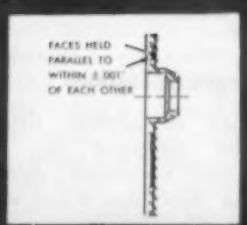
Part—Cover. Material—cast iron. Operations—turn elliptical contour of .220"; 15° angle on face and short O.D. on opposite end. Comments—could not be turned economically prior to use of Air-Gage Tracer.



Part—Gear housing. Material—aluminum casting. Operations—turn, face and bore. Total machine time—3 minutes.



Part—Sleeve shell. Material—seamless steel tubing. Operations—face and bore both ends. Floor to floor time per piece—1¾ minutes.



Part—Bearing cover. Material—aluminum forging. Operations—turn, face both sides and bore. Floor to floor time per piece—1¾ minutes. Previous production—7 pieces per hour.

How One Leading Contract Shop Affords It

What's the secret of absorbing these costs—with competitive bidding and profit margins as they are in the contract shop field today?

"Simple," says C. C. Gregson, President, Illinois Gage and Manufacturing Company of Franklin Park, Ill., leading supplier of highly specialized machining of aluminum and magnesium castings. "We are able to produce a better job faster and hold close tolerances more economically than shops *provided with conventional equipment*. Setup and tooling is so minor that in most instances the customer is not even charged for it."

Note that phrase "conventional equipment"—it's the pay-off! The one 16" and the two 13" Monarch lathes you see pictured below are all Monarch Air-Gage Tracer equipped. So is the 10" Monarch that isn't in the picture. There's your difference!

To quote again, "we have found they speed up production anywhere from 10% to 90%." Air-Gage Tracers in your plant would likely enable you to realize similar savings. Why not investigate? . . . ***The Monarch Machine Tool Co., Sidney, Ohio.***

Monarch
ACCURACY • ECONOMY • LONG LIFE
TURNING MACHINES

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

BUFFALO BOLT SERVICE *completes the picture*

It's our aim to see that you get the right bolts... *when you need them.*
That's why we have set up the finest and fastest service organization in the business.
Now you can get immediate and *accurate* information on prices, deliveries or other pertinent data...by merely calling your Circle B distributor or our nearest District Office.
Try it on your next fastener order.

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BUFFALO BOLT COMPANY
Division of Buffalo-Eclipse Corporation
NORTH TONAWANDA, N. Y.

Making both FASTENERS & FRIENDS for 100 years

Over-all length, about 662 ft; length between perpendiculars, 630 ft; breadth, 87 ft; depth to upper deck at sides, 45 ft 6 in. Designed deadweight capacity on 33 ft 11 in. molded draft and in seawater at 35 cu ft per gross ton is about 31,000 tons.

Preway Buys Space Heater Line

Preway Inc., Wisconsin Rapids, Wis., purchased the electric space heater manufacturing operations of Federal Malleable Co., Milwaukee. The new line will be added to Preway's line of oil and gas space heaters, oil furnaces and gas and electric ranges. Federal Malleable's chief business, making malleable iron castings, will continue.

Mathews Conveyer Expands

Mathews Conveyer Co., Ellwood City, Pa., has combined the celebration of its 50th anniversary with the completion of a broad expansion project. The building program involved an engineering and office building and two major additions to the plant. The manufacturing area was increased 30 per cent. The program cost about $1 million.

Downingtown Iron Moves

Downingtown Iron Works Inc. moved its sales engineering and administrative staffs into a new office building in Downingtown, Pa. The firm, a division of Pressed Steel Tank Co., Milwaukee, builds heat transfer equipment and fabricates large fractionating towers, stills, pressure vessels and ASME tanks, specializing in clad and alloy plate work.

Kelite Merges Operations

Integration of several Kelite corporations (engaged in the chemical and equipment fields) operating in the United States was completed when stockholders of Kelite Products Inc., Los Angeles, accepted a plan for exchange of shares. The combined organization is incorporated as Kelite Corp., with L. C. Sorensen as president and W. G. Nuelsen as senior vice president. William Sorensen

UNDER PRESSURE? TRY 4500 PSI AT 1150 F

There's a new concept in big boiler design: The Universal Pressure Steam Generator. It operates either below the critical—3206 psi—or smashes through the pressure barrier. A unit now being built has a design pressure of 5500 psi, delivers steam at 4500 psi and 1150 F. It's a "once-through" unit; put water in one end of a tube and steam comes out the other, without using a steam drum.

When B&W engineers designed this new boiler they turned to their own metallurgical and tubular products experience with alloys for pressure and temperature service to devise the tubing complex that is the heart of the unit. The chart shows the variety of analyses in sizes from 1-inch O.D. to 2½-inch O.D. and wall thicknesses from 0.10-inch to 0.55-inch.

Carbon Steel • Carbon Moly
Croloy ½ • Croloy 1
Croloy 1¼ • Croloy 2¼
Croloy 3M • Croloy 9M
Croloy 18-8

The best way to avoid operating under *personal* pressure on any job is to call for B&W Pressure Tubing. There's a grade, size, length and wall for virtually every pressure, temperature and corrosion resistance requirement. *Write for Technical Bulletin 55.*

B&W
TUBULAR PRODUCTS DIVISION

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa. and Milwaukee, Wis.: Seamless Tubing, Welded Stainless Steel Tubing
Alliance, Ohio: Welded Carbon Steel Tubing
Milwaukee, Wis: Seamless Welding Fittings

TA-5028(P)

Which is the ECONOMY SIZE?

3 times stronger than carbon steel, Lukens "T-1" steel slashes equipment weight, reduces costs

The lighter weight, reduced thickness of Lukens "T-1" steel, in comparison to heavier, thicker plates of ordinary carbon steel, makes possible substantial over-all savings in material and fabrication costs for equipment builders. This new all-purpose steel—a unique, low-carbon, quenched and tempered alloy plate steel—has a yield strength three times greater than ordinary carbon steel. It can cut costs by reducing weight and still increase payload and efficiency.

Equipment fabrication is no problem with Lukens "T-1" steel. It is readily welded without preheating or stress relieving; equipment can easily be fabricated, modified or repaired at the field site. Its exceptional toughness and resistance to wear and impact lowers maintenance costs and lengthens equipment life. Additional savings are possible where Lukens' range of steel plate sizes—including the widest and heaviest available anywhere—makes possible the use of wider sizes that require fewer welded seams.

Lukens "T-1" steel is the most recent addition to Lukens' complete line of carbon, alloy and clad steels. Its unusual combination of properties suit it especially to application in pressure vessels, bridges, shipbuiliding, construction machinery and general industrial equipment. On problems of design, selection, application and fabricating techniques, Lukens offers full technical assistance. If you would like further information on Lukens "T-1" steel, write for Bulletin 765 on its properties, characteristics and applications. Address: Manager, Marketing Service, 773 Lukens Building, Lukens Steel Company, Coatesville, Pa.

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LUKENS STEEL COMPANY, COATESVILLE, PA.

is executive vice president with headquarters in New York. Kelite of Canada and Kelite of Mexico will continue to operate independently.

NEW ADDRESSES

Ruud Mfg. Co. moved its executive offices to 2025 Factory St., Kalamazoo 24-F, Mich.

Pennsylvania Salt Mfg. Co. moved its executive offices and headquarters of its operating divisions to 3 Penn Center Plaza, Philadelphia 2, Pa. The following components of the consolidated company are included: Pennsalt International Corp., Chemical Specialties Division, I. P. Thomas Division, Industrial Chemicals Division, Sharples Chemicals Division.

REPRESENTATIVES

Cleveland Instrument Co., Cleveland, manufacturer of electronic gaging, sorting and control equipment, appointed as its representatives: Size Control Co., Chicago; Larry Hammond Co., Milwaukee; Southwestern Gage Co., Dallas. C. O. Brandes Inc., Cleveland, was appointed export agent for all countries except Canada.

Roll Formed Products Co., Youngstown, manufacturer of continuously rolled metal shapes, appointed Niedringhaus Bros., Clayton, Mo., to represent the firm in the central Mississippi valley states.

Tyee Machinery Co., South Seattle, Wash., has been named by **Ekstrom, Carlson & Co.**, Rockford, Ill., to serve as its representative in Washington, Idaho and Montana. The Rockford firm makes metalworking and woodworking machinery and tools.

Kingsbury Machine Tool Corp., Keene, N. H., appointed Merit Machinery Inc. as its distributor in western Pennsylvania, West Virginia and northwestern Maryland.

(*Please turn to page* 84)

"One day we were using 14 hand sprayers ...the next day, 2

"One day we were using 180 gallons of paint ...the next day, 75

"Fantastic?" "Not exactly. It's a typical, on-the-job-example of the savings made possible with the

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And, in this instance* production was increased; quality of the work improved, and rejections cut to practically nothing.

*Fluorescent Fixtures of California, in their modern plant in South San Francisco, uses the Ransburg No. 2 Process Reciprocating Disc Atomizer to paint their popular line of ALL-BRITE lighting fixtures. The quotes above are from Works Manager, R. H. Shaffer.

Regardless of the type of product you manufacture, if it's painted... and, if your production justifies conveyorized painting, you should look into the savings (and improved quality) which can be yours with one of the Ransburg Electrostatic Painting Processes. May we tell you about complete Ransburg services?

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CHATEAUGAY TOUGH

Photo, courtesy of Wysong & Miles Company, Greensboro, N. C., manufacturer of power squaring shears, woodworking machinery, bending rolls.

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REPUBLIC STEEL

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PIG IRON MAKES CASTING JOBS EASY...

The gear box and end frame housing, shown at left, for a power squaring shear are good examples. Because both hold oil to lubricate moving parts, freedom from porosity is a prime casting requirement—plus density, strength and wear-resistance.

To meet these strict requirements, the manufacturer uses Chateaugay, Republic's exclusive premium Pig Iron. The results are dense, strong castings with high wear-resistance and no porosity. Chateaugay fills molds completely and quickly—sets rapidly and shrinks evenly. Regardless of size or shape, Chateaugay produces uniform soundness, close grain structure and uniform cross-section density throughout every casting.

Chateaugay castings are inherently tough, strong and resistant to wear. Yet they machine easily and economically whether planed, milled, drilled, tapped, reamed or ground.

A Republic Pig Iron Metallurgist will be happy to give you the complete story on Chateaugay, the low phosphorus, copper-free Pig Iron, and the way it can help you make tough casting jobs easy. There's no cost or obligation for his services. Just let us know when you would like him to call.

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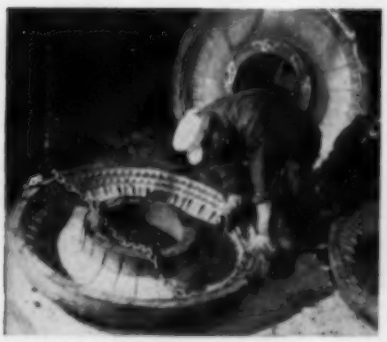

EASY WAY TO HANDLE HEAVY CASTINGS—Republic Chain Slings provide an exceptionally high degree of safety in numerous foundry operations, like moving and handling heavy castings, flasks, etc. Made by Republic's Round Chain Division, they're available in alloy steel, High Test Supersteel, and wrought iron. All are proof tested and warranted to meet or exceed specifications.

EASY WAY TO STACK ENORMOUS WEIGHTS—Republic Wedge-Lock Steel Shelving is designed for high stacking of heavy items—with no sagging, swaying or buckling. Joints actually get tighter as weight increases. Made by Republic's Berger Division, Wedge-Lock Steel Shelving provides maximum loading in minimum floor space. Completely flexible, it assembles quickly and easily.

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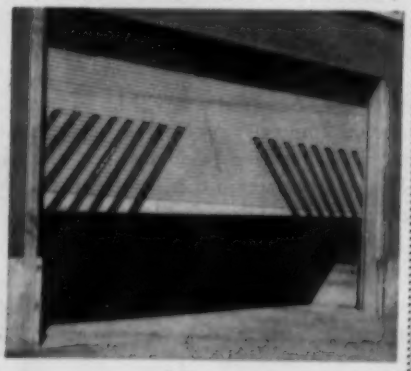

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Kinnear Rolling Doors are built any size, for old or new buildings, with manual, chain, crank or motor operation. Write for complete information.)

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(*Concluded from page* 81)

Blair-Martin Co. Inc., South Pasadena, Calif., will be sales representative for these additional clients: **Barth Corp.**, Cleveland; **Hofman Laboratories Inc.**, Newark, N. J.; **Micron Machine Corp.**, Brooklyn, N. Y.

Hargrove-Green Co., Los Angeles, has been appointed to represent **Gries Reproducer Corp.**, New Rochelle, N. Y., in southern California. Gries specializes in the contract production of small zinc alloy die-castings, including fasteners, and tiny plastic injection molded parts.

ASSOCIATIONS

Officers of **American Society for Testing Materials**, Philadelphia, are: President, Claire H. Fellows, Detroit Edison Co., Detroit; vice president, R. T. Kropf, Belding Heminway Co. Inc., New York.

Robert W. Shearman was named secretary of the metals branch, **American Institute of Mining, Metallurgical & Petroleum Engineers**, New York.

An Aluminum Division has been formed by the **Porcelain Enamel Institute**, Washington. Charles P. Lohman, Pemco Corp., Baltimore, was elected chairman of the new division. The institute also promoted W. N. Brinker to the position of market development manager; Elizabeth O'Connor, to assistant secretary of PEI's national safe transit committee.

VACATIONS

Canadian Westinghouse Co. Ltd., Hamilton, Ont., will close its plants from July 18 to Aug. 2, inclusive, for vacations.

American Hoist & Derrick Co., St. Paul, will close its offices and plants in that city, Kearny, N. J., and the Thomas Laughlin Division, Portland, Me., from July 18 to July 31, inclusive. Emergency communications and parts shipments will be handled as speedily as practical with the skeleton crews.

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Kennametal tools working in a coal mine.

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The Problem: Various mining augers originally used with Kennametal Tungsten carbide bits were frequently replaced due to bending and twisting—particularly in hard, fast drilling. This resulted in excessive downtime, and limited potential drilling life of the Kennametal bits . . . which are capable of drilling from 4,500 to 12,000 feet.

The Solution: New Kennametal augers, manufactured from OSTUCO Seamless Steel Tubing, last the life of several bits. These tubular augers have rigidity to stand the high pressure of fast, long-hole drilling, yet are light weight for easier handling underground. Lightness, rigidity and long wear are especially important in drilling holes of 100 feet depths during mining of anthracite coal and gypsum.

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Technical Outlook

NEW STANDARDS—Can mechanical tests predict the service life of metals for nuclear performance? Irradiation causes carbon and stainless steels to behave so differently that a new concept of test values is needed. J. C. Wilson, supervisor of radiation metallurgy at Oak Ridge National Laboratory told the ASTM at its annual meeting (June 27) that this is the problem it will face when it writes the first specification on steels for nuclear reactors. Neutron radiation levels used in Mr. Wilson's tests were 100 to 1000 times lower than may be encountered in power reactors.

NEEDED HELP—Powder metallurgy parts are getting stronger—often at elevated temperatures where it's most needed. Example: Fatigue strength of aluminum powder parts (such as Alcoa's grade 257) at 800 to 850°F is almost equal to wrought alloys at 400 to 450°F. The information was brought to light by Fritz V. Lenel, Rensselaer Polytechnic Institute in ASTM's Gillett Memorial Lecture.

MORE WAYS—The room temperature strength of powder parts is gaining through use of higher densities, prealloyed steel powders, infiltration and precipitation hardening, the Gillett lecturer pointed out. Swedish manufacturers are using electrolytic iron powder, plus 2 per cent copper. The hardened part has a tensile strength of 90,000 psi. The British are using a higher sintering temperature (2375°F) with iron powder mixtures containing 5 per cent nickel, 0.5 manganese and 0.2 carbon.

LONG-RANGE CORROSION—Unveiled at the ASTM meeting were results of 20-year outdoor exposure tests made by its committee B-3 on nonferrous metals. The project required about 9000 test specimens—wrought alloys of zinc, nickel, copper, lead, tin and aluminum. They were exposed to the atmosphere at nine locations across the country and evaluated after 1, 3, 6, 10 and 20 years.

INSIGHT—A metallographic x-ray machine operating on a continuous current of 120 milliamperes at 45,000 v is looking into basic problems of matter for Westinghouse. Being studied: The influence of atomic arrangement on magnetism and the mechanisms of metallurgical reactions. Among its unusual features are water-cooled revolving targets plated with metals with melting points too low for conventional x-ray use.

POWDERED LUBRICANT—You can lubricate extremely tight fitting metal-to-metal parts with a finely powdered lubricant applied by dusting or dipping. Called Acrawax C Atomized by its developers, Glyco Products Inc., New York, the material is nontacky, noncorrosive, insoluble in water, oil and solvents and has a melting point of 285° F.

FRIENDLY NITROGEN—A steel developed for strength at extremely high temperatures was found to be improved when the nitrogen content was increased and a critical alloying element decreased. In another instance, presence of nitrogen improved one steel's resistance to fracture in cold weather.

PLASTICS AND COLD—Glass fabric laminates are the strongest plastics at low temperatures, says Picatinny Arsenal. All laminated thermosetting materials tested by the arsenal showed an increase in tensile strength to −40° F, with a slight reduction in strength as temperatures approached −65° F.

Metalworking Outlook—p. 39 Market Outlook—p. 127

Heat Treating Magnesium

By M. E. BROOKS
Magnesium Department
Dow Chemical Co.
Midland, Mich.

A load of magnesium castings goes into heat treating furnace

SAND and permanent mold castings are the most frequently heat treated magnesium products. Solution heat treatment improves their tensile strength, ductility and shock resistance. Used with aging, it helps their tensile strength and hardness.

Certain extrusion alloys are artificially aged to increase tensile and compressive strength. Extrusions, sheet and plate products are annealed to remove residual stresses, to obtain flatness tolerances and to change the metallurgical composition for better toughness and workability.

Types—Sheet products generally come from the mill in three conditions: 1. Annealed (-0). 2. Strain hardened (-H10, -H11). 3. Strain hardened and partially annealed (-H23, -H24, -H26). Strain hardened material is converted to the fully annealed condition by heating for at least an hour at 600 to 700° F.

Extruded magnesium comes in the as-extruded (-F) or artificially aged (-T5) condition. To anneal aged extrusions and convert properties to the as-extruded state, they are heated an hour (or

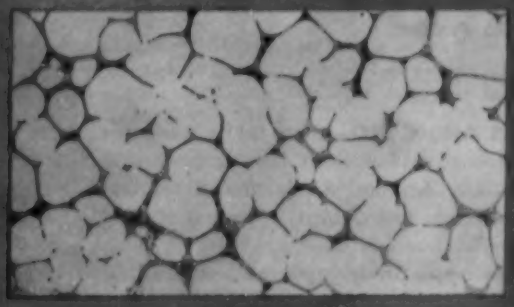


Fig. 4—Microstructure of alloy EZ33A, artificially aged (-T5), for 5 hr at 420° F (X250)

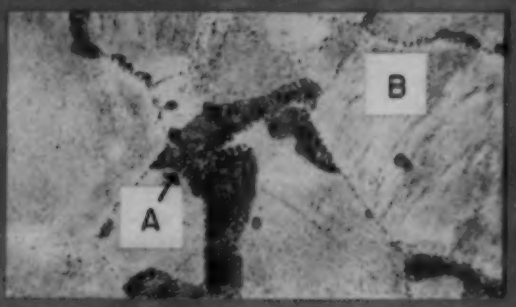


Fig. 5—Types of precipitate that come from artificial aging after solution heat treatment: A—pearlitic; B—fine Widmanstatten (X500)

Alloy C Structures—X250

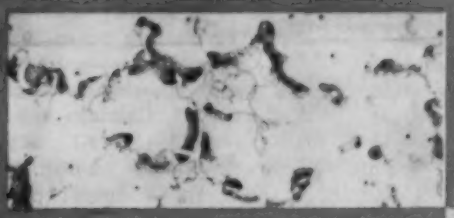


Fig. 1—As cast (-F)

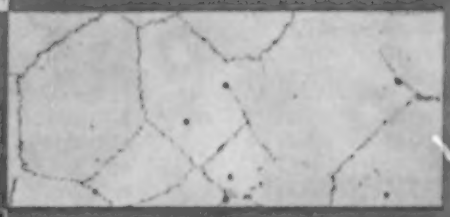


Fig. 2—Solution heat treated (-T4)

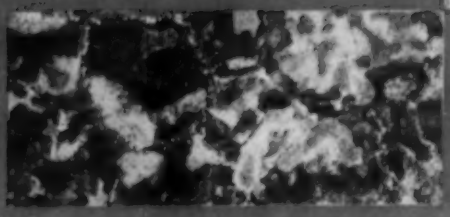


Fig. 3—Solution heat treated and artificially aged (-T6)

more) at a minimum of 600°F.

The only standard extrusion alloys adaptable to aging are Dowmetal 0-1 and ZK60A. Artificial aging requires heating for 20 hr at 300°F.

Castings—In sand and permanent mold castings, solution heat treatment is indicated by "-T4" following the alloy letters. When used with aging, the designation is "-T6." Figs. 1, 2 and 3 show typical microstructures of alloy C in the as-cast (-F), heat-treated (-T4), and heat-treated and artificially aged conditions (-T6).

Alloy G, for permanent mold castings only, is given a "-T61" treatment. This takes longer artificial aging after solution heat treatment than the "-T6" condition. It gives higher tensile yield strength than the "-T6" condition.

Stabilized — Artificial aging of cast parts (designated "-T5") affects the mechanical properties to a small extent. It results in less permanent growth and better dimensional stability. It also relieves casting stresses and decreases possible warpage after machining.

Table 1 gives composition and mechanical properties of magnesium casting alloys in as-cast and various heat-treated and aged conditions. Table II summarizes heat treating conditions.

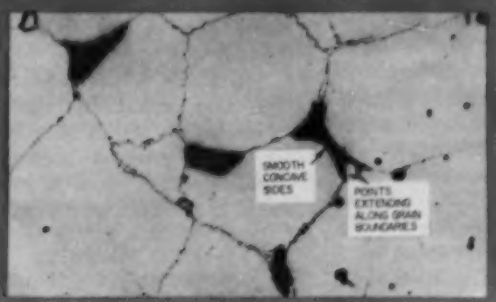


Fig. 6—Microstructure shows fusion voids caused by overheating castings during treatment (X300)

HEAT TREATING SCHEDULES

"-T5" Condition — This artificial aging treatment requires the following schedule: Alloys C and H are aged for 4 hours at 500 (±10°F). EZ33A is aged 5 hours at 420 (±10°F).

Some manufacturers use 12 hours at 350 (±10°F) for alloy EZ33A, but Dow's experience is that the shorter time at higher temperature gives the same results. A typical microstructure

TABLE II—Heat Treating Schedules for Magnesium Casting Alloys

Dow-metal	Artificial Aging (-T5) Time-hr	Temp ±10°F	Solution Heat Treatment (-T4) Time-hr	Temp ±5°F	Aging after Solution Heat Treatment (-T6) Time-hr	Temp ±10°F
C	4	500	18	765	4	500
	Antigermination Schedule		a 6	765		
			b 2	665		
			c 10	765		
G	—	—	18	775	5	425
	Antigermination Schedule		d 6	775	-T61	
			e 2	665		
			f 10	775	24	400
H	4	500	12	725	5	425
AZ91C	—	—	18	775		
	Antigermination Schedule		a 6	775		
			b 2	665	16	335
			c 10	775		
EK30A	—	—	18	1050	16	400
EK41A	16	400	18	1050	16	400
EZ33A	5	420	—	—	—	—

Before treatment at times and temperatures shown, alloy C, H and AZ91C castings are brought up to holding temperature at uniform rate of rise. About 2 hr are required for heating the average casting. After solution heat treating and before aging, castings are allowed to air cool to room temperature.

for the alloy and condition is shown in Fig. 4.

EK41A is aged for 16 hours at 400 (±10°F).

"-T4" Condition—This is a solution heat treatment of sand and permanent mold castings of the Mg-Al-Zn series.

It begins with a heating period in which the temperature of the furnace is raised from the loading (about 500°F) to the holding or soaking temperature for each alloy. Melting or fusion (and resultant voids) is eliminated by the slow heating of the cast parts through the lower temperature ranges. This diffuses and eliminates some of the alloy's eutectic compounds at a temperature below their melting point. An SO_2 atmosphere is used.

The temperature rise is gradual over a 2-hour period. The time here is affected by the size of the load, composition, size, weight and section thickness of the castings being treated; however, 2 hours is considered a good average.

Load at Temperature—To get the "-T4" condition in castings of alloy G and the rare earth types, you may load them into the furnace at heat treating temperatures. Holding (or soaking) periods begin at the time the load reaches the recommended temperature for solution heat treating.

Alloy H castings are soaked for 12 hours at 725 (±5°F); alloy C, 18 hours 765 (±5°F); AZ91C, 18 hours at 775 (±5°F); and EK30 and EK41A, 18 hours at 1050 (±10°F). Alloy G castings are soaked for 18 hours at 775 (±5°F).

Departure—Alloy C castings are sometimes given a different solution heat treating schedule. Reason: This alloy is susceptible to "germination." Grain growth may come during the latter part of the heat treating cycle.

To avoid large grains and reduced mechanical properties common to this condition, alloy C castings are solution heat treated using this antigermination schedule:

1. Castings are held 6 hours at 765 (±5°F). 2. Temperature is reduced to 665 (±5°F) and held for 2 hours. 3. Temperature is raised to 765 (±5°F) and held for 10 hours.

Changed, Too — Alloy G and AZ91C castings may also require a slightly different solution heat treating schedule because of possibility of germination. A three-step schedule is used:

1. Castings are held 6 hours at 775 (±5°F). 2. Temperature is reduced to 665 (±5°F) and held for 2 hours; 3. Temperature is raised to 775 (±5°F) and held for 10 hours.

When the solution heat treating period is finished, castings are removed from the furnace promptly and air cooled to room temperature or to the temperature for aging, if it is to be done immediately. Forced air cooling is used on large, closely packed castings.

More Time — Some furnaces, when heavily loaded, may not give the required properties in the specified time. To correct this, castings are left in longer.

The furnace temperature must not be raised. In no case should maximum heat treating temperatures exceed 732°F for alloy H and 772°F for C.

"-T6" Condition—This requires solution heat treating as previously described. After cooling, the castings are aged: Alloy C needs 4 hours at 500 (±10° F); Alloys G and H, 5 hours at 425 (±10°F); AZ91C, 16 hours at 335 (±10°F); and EK30A and EK41A, 16 hours at 400 (±10°F).

After aging, castings are air cooled to room temperature. The type of precipitate that comes from artificial aging after solution heat treatment is shown in Fig. 5.

"-T61" Condition — The "-61" treatment is given only to alloy G permanent mold castings. It differs from the standard "-T6" treatment only in the artificial aging period.

Parts are solution heat treated and then artificially aged for 24 hours at 400 (±10°F). The longer aging gives a higher tensile yield strength than is obtainable with the "-T6" treatment.

CONTROL

Properties—To check effectiveness of heat treating, tension test bars of the same composition and in the same condition are placed in the furnace with each load of

TABLE I—Composition and Mechanical Properties of Magnesium Casting Alloys

Magnesium Alloy		Condition (1)	Tensile Strength psi		Tensile (2) Yield Strength psi		Elongation in 2 in., per cent		Compressive Yield Strength psi	Shear psi	Hardness	
			Typical	Min	Typical	Min	Typical	Min			Brinell	Rockwell B
C	Al 9.0, Zn 2.0, Mn 0.15	-F	24,000	20,000	14,000	10,000	2	1	14,000	19,000	65	77
		-T4	40,000	34,000	14,000	10,000	10	6	14,000	19,000	63	75
		-T5	24,000	20,000	14,000	11,000	2	-	—	20,000	—	—
		-T6	40,000	34,000	23,000	18,000	2	1	23,000	22,000	84	90
G	Al 10.0, Mn 0.10	-F	22,000	20,000	12,000	10,000	2	-	12,000	17,000	54	65
		-T4	40,000	34,000	13,000	10,000	10	6	13,000	19,000	52	62
		-T6	40,000	34,000	16,000	15,000	4	2	16,000	21,000	69	80
		-T61	40,000	34,000	22,000	17,000	1	-	22,000	—	—	—
H	Al 6.0, Zn 3.0, Mn 0.15	-F	29,000	24,000	14,000	10,000	6	4	14,000	18,000	50	59
		-T4	40,000	34,000	14,000	10,000	12	7	14,000	18,000	55	66
		-T5	29,000	24,000	14,000	10,000	5	2	—	19,000	—	—
		-T6	40,000	34,000	19,000	16,000	5	3	19,000	21,000	73	83
AZ91C	Al 8.7, Zn 0.7, Mn 0.13	-F	24,000	18,000	14,000	10,000	2	-	14,000	18,000	52	62
		-T4	40,000	34,000	14,000	10,000	11	7	14,000	18,000	55	66
		-T6	40,000	34,000	19,000	16,000	4	3	19,000	21,000	73	83
EK30A	RE 3.0, Zr 0.2	-T6	23,000	20,000	16,000	14,000	3	2	16,000	—	45	49
EK41A	RE 4.0, Zr 0.7	-T5	23,000	20,000	16,000	14,000	1	-	16,000	—	50	59
		-T6	25,000	22,000	18,000	16,000	2	1	18,000	—	50	59
EZ33A	Zn 3.0, RE 3.0, Zr 0.75	-T5	23,000	20,000	16,000	14,000	-	2	16,000	—	50	59
HK31XA*	Zr 0.7, Th 3.0	-T6	37,000	—	18,000	—	10	-	18,000	—	—	—
HZ32XA*	Zn 2.0, Zr 0.7, Th 3.0	-T5	32,000	—	15,000	—	8	-	15,000	—	—	—
ZK51XA*	Zn 4.6, Zr 0.75	-T5	41,000	34,000	26,000	21,000	8	5	26,000	—	65	77

*Properties based on limited data. Not standard Dow alloys.
(1) -F = as cast; -T4 = solution heat treated; -T5 = artificially aged; -T6, -T61 = solution heat treated and artificially aged
(2) Yield strength is defined as the stress at which the stress-strain curve deviates 0.2% from the modulus line.

castings. The test bars (cast to ASTM Standards) are pulled and given the usual tests for mechanical properties. Frequency of tests depend on the specification.

Metallographic examination of tension bars and sections from scrap castings are a check on quality, too.

Temperature Control—The temperature range for heat treating magnesium alloys is narrow. This means temperature variation in the furnace must be held to a minimum.

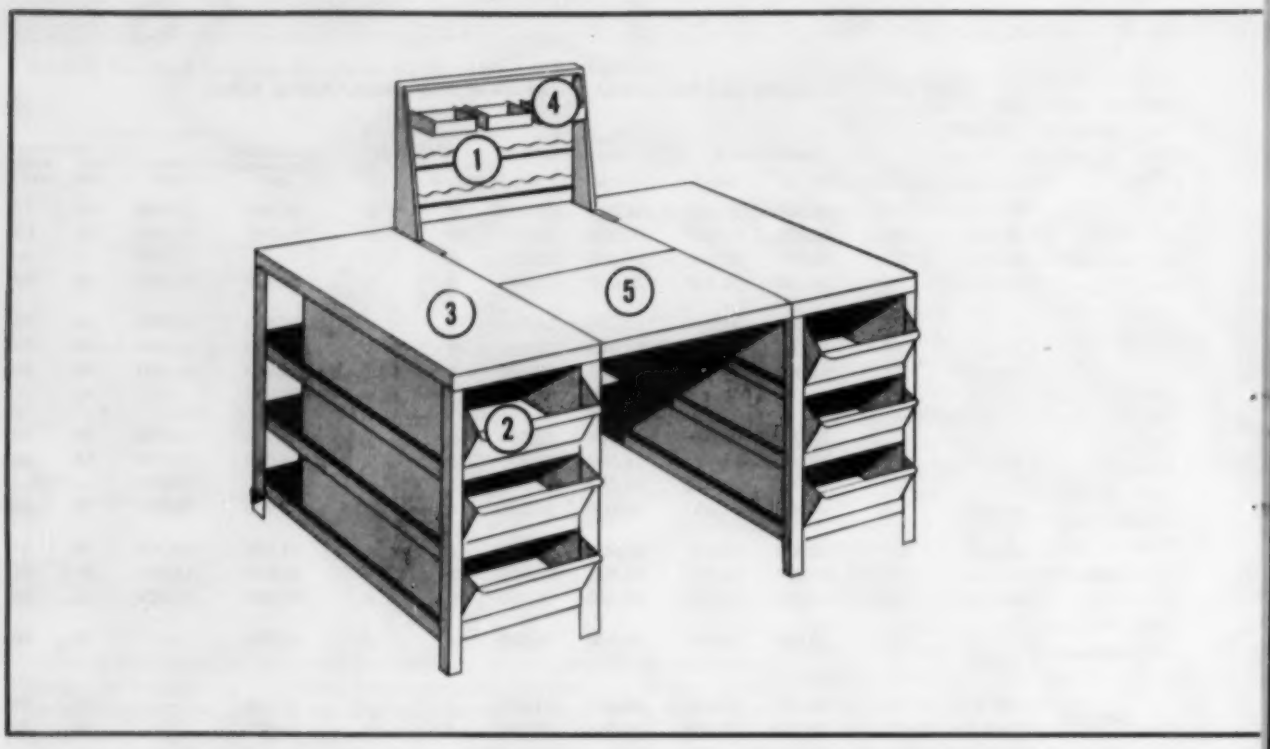
Uniformity of temperature throughout the furnace is obtained by a high rate of air recirculation. Temperature distribution is checked regularly, following a standard checking procedure. Ten to twenty thermocouples are fastened to the inside furnace wall or to casting racks, with the leads brought out of the furnace so that temperature can be read during the heat treat cycle.

Evidence—Fig. 6 shows in microstructure the fusion voids which are a result of overheating during heat treatment. The strength of a magnesium casting is materially reduced.

The protective SO_2 atmosphere greatly reduces the fire hazard. Overheating of castings can result in incipient melting and burning. Incipient melting can cause deterioration of properties without surface burning.

Insurance—Heat treating furnaces should be equipped with two sets of controls operating independently. One set holds the desired furnace temperature, while the other should be set slightly above furnace temperature to act as a safety cutoff if the first control fails. High temperature alarms are another safety feature.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Bldg., Cleveland 13, O.*



BETTER MATERIALS HANDLING—II

Module Units Speed Subassembly

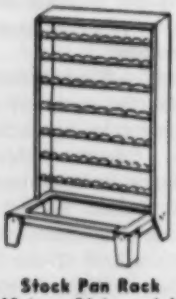
By BYRON E. KENNEL
Assistant Editor

PREFAB WORK STATIONS add flexibility to materials handling on the production line.

Called module units, they combine the advantages of angle iron benches and commercial steel shelving. They provide good tool placement and a stable work surface, plus efficient handling, storage and control of parts.

The units can be installed quickly. That's one reason why Ford Motor Co. chose them for subassembly in its three new assembly plants in San Jose, Calif., Mahwah, N. J., and Louisville.

Components—With the versatility of Tinker Toys, module units fit



Stock Pan Rack
12 in. x 36 in. x 4 ft 6½-in. Rack holds stock pans for variety and selectivity of small parts —good in repair areas

Hanger
Length 6 in. Height of hook 2¾-in. Hanger is hung on racks on top of work tables to keep supply of material in range of worker

Top Reinforcing Plate
28⅝ x 14-5/16 x ¼-in. Plate attached to top of stand gives increased rigidity

Pan Rack
Two sizes: Each 23 in. high and 4⅝-in. wide, lengths are 13-9/16 and 27⅞ in. Used on top of work tables

Stand
28⅝ x 14-5/16 x 34¼-in. Bolts join stands

Stock Pans
Four sizes: Each is 6 in. long, 2¾-in. high. Widths are 3-21/32, 5-17/32, 7-25/64 and 11⅛-in. Pans are hung on racks on top of work tables to keep supply of material in range of worker

Tote Box
Three sizes: 14 x 8 x 8 in., 14 x 12 x 8 in. and 23 x 12 x 8 in. Stores one-week supply of small parts in line feed

Shelf
14-5/16 x 28⅝-in. Shelves are used to connect stands and expand storage space or work surfaces

bility essential to good time and motion techniques.

Here's the Saving—The initial cost of module units is less than that of fabricated angle iron benches. Good housekeeping is promoted. The checking and filling of pans and boxes are speeded by standardization. And part number identification is made easier.

An engineering change can make a conventional subassembly station completely obsolete—or call for a bench that is longer, wider or of a different shape. With module units there is no obsolescence; a rearrangement will adapt the work station to the new operation.

It takes two or three weeks to make and install a nonstandard subassembly station. Parts for a module unit can be withdrawn from stock and assembled immediately.

When a module work station is no longer needed, it may be disassembled and returned to stock.

together to meet any subassembly need. The stand is twice as long as it is wide. This permits expansion in both length and width. Product: A variety of setups.

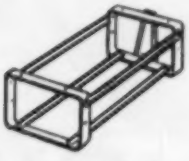
Tote boxes (a key factor in obtaining a universal work station) are used to store a week's supply of small parts in line feed at Ford's Louisville plant. Capacity of the tote boxes was determined from a detailed study of the five-day float requirements of all line feed containers in one of Ford's plants.

Module stands possess enough rigidity and stability for 80 per cent of all subassemblies. Where extreme stability is needed in the work surface, the unit can be capped with a ¼-in. plate. Fixtures, when required, are tack welded onto the plate.

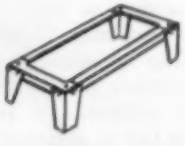
The low cost of the module stand makes it practical for standard part storage along the line. As many as nine different parts can be stored in less than 3 sq ft.

Stock pan holders are designed to fit the top of the module unit stand. They give the part accessi-

This is the second in a series of four articles on better materials handling. The first was "Setting the Stage for Efficiency." Succeeding articles will be on storage and receiving and the lift truck-tow train team. Extra copies of each article are available in quantities from one to three until the supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.



Tote Box Adapter
23¼ x 13½ x 9⅛-in. Interlocking storage shelves for tote boxes are used for material storage where no work surface is needed

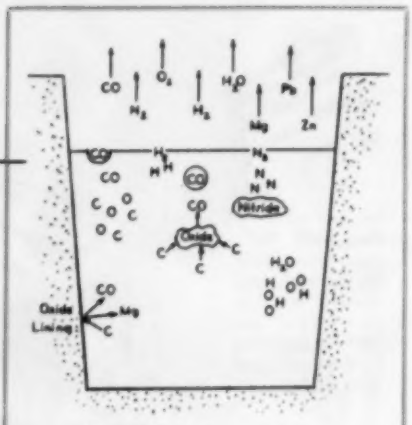


Pressed Steel Pallet
Two sizes: 23¾ x 13 x 8⅛-in. and 23¾ x 26¼ x 8⅛-in. Bases for single or double tier of tote box adapters

Hanging Racks
Two sizes: Both 6¼-in. high, 13⅜ or 27¾-in. long. Racks are used on top of work tables to hold hangers or pans

What Vacuum Holds for Precision Casting

1. **Elimination of gases and their bad effects on dimensions, soundness, mechanical properties and surface finish**
2. **Elimination of slag and dross**
3. **Elimination of residual elements causing hot shortness**
4. **Closer analytical control**
5. **Higher alloy content of reactive components**



The melt under vacuum

VACUUM MELTED and cast precision castings are on the way. Vacuum Metals Corp., Syracuse, N. Y., which has been precision casting vacuum melted laboratory test specimens since 1947, has been investigating the production potential of the process.

Although the point of commercial exploitation has not been reached, this is a good time to review possibilities, James H. Moore, general manager of Vacuum Metals, told the spring meeting of the Investment Casting Institute.

Pro—When a melt is made in vacuum, the most obvious effect is the elimination of slag and dross from reaction of the melt with the atmosphere. Atmospheric oxygen, nitrogen and hydrogen are not present to dissolve in the melt.

This effect could be obtained from an inert atmosphere, but vacuum adds a refining action (see illustration). Hydrogen and nitrogen are reduced by the simple effect of vacuum in lowering solubility. Unstable gas-metal compounds decompose. The low pressure forces the reduction of oxides and dissolved oxygen, with evolution of carbon monoxide. Water vapor formed by the reaction of hydrogen with dissolved oxygen is pumped off.

Con—On the negative side, reactions with the crucible or lining of the furnace may be favored by low pressure: For example, magnesia may be reduced to form dissolved magnesium and dissolved oxygen or carbon monoxide.

Volatile impurities, such as lead, zinc, cadmium, bismuth and magnesium, evaporate from the melt. This can be a disadvantage when a controlled alloying addition of a volatile metal must be made prior to vacuum degassing. However, the loss is predictable, and allowance for it can be made.

Good-Bye, Gas—With gassy alloys, which tend to shrink during solidification, vacuum melting and casting have much to offer in maintaining dimensions. But incomplete degasification followed by casting in vacuum can give bad porosity because of the reduced pressure head on the casting.

Nitrogen, oxygen and hydrogen as primary or secondary compounds in the metal can lower ductility and strength, especially in high temperature alloys and high chromium steels. We've seen the improvement that vacuum melting can make in the strength of wrought alloys. The same alloys in cast form give promise of similar improvement in strength and ductility.

Properties such as high conductivity in copper may be retained while getting a sound gas-free casting. Because no metallic deoxidizer is required, no residual deoxidant is left in solution to affect the property.

Sound Castings — Absence of slag or dross offers better surface quality and soundness through elimination of films carried into the casting. Many elements which can cause hot shortness and consequent tearing of the casting are removed by vacuum melting.

In the production of wrought alloys, elimination of oxidation and slagging losses gives much closer heat-to-heat reproducibility than air melting. It should do the same for castings. Savings in costly and strategic alloying elements are impressive. In beryllium copper, beryllium loss in melting is decreased from about 10 per cent to a fraction of 1 per cent.

By minimizing the combination of reactive metals like titanium and aluminum with oxygen and nitrogen during melting, it has been possible to go to higher alloy contents, with consequent increase in strength while keeping a usable ductility level.

Production — Vacuum refining promises to eliminate certain process variables, but it also introduces more complex methods and equipment. A production cycle comparable to air melting practice must be devised either by fast cycle small units or a large unit handling a multiple mold line. Modifications probably will be required in such steps as precoating and mold firing to avoid gas evolution problems in vacuum operation.

Some precision casting problems may be solved by making small investment heats under a protective atmosphere, using a master melting stock which has been vacuum refined. For other alloys, optimum results can be obtained only if the investment heat also is under vacuum, or if refining and casting are done in one heat.

Ingots... cut cropping loss by 20% to 30% with Armstrong Ingot Insulation

More useable steel per ingot results from the use of Armstrong Ingot Insulation. Thrown in on top of the poured steel, cork particles coated with special clays prevent the molten metal from cooling too rapidly. Pipe penetration is reduced. Chemical composition of the steel is unaffected.

If you would like to test Armstrong Ingot Insulation in your plant, call your nearest Armstrong office. For free booklet on the Armstrong line of insulating refractory products, write Armstrong Cork Company, 2707 Reed Avenue, Lancaster, Pennsylvania.

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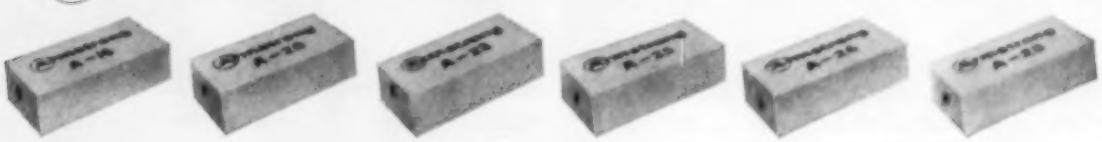

First, skulls must be broken and pushed over the side

Chunks that are left are shattered and evenly graded

Simplify Dump-Track Maintenance

WITH ONLY 38.6 miles of roadbed, you wouldn't suspect that the Union Railroad, Pittsburgh, has a bothersome track maintenance problem.

But a single piece of equipment is going a long way toward curing the headache.

Troublespots are three slag dumps where tracks are constantly being cleared of solidified slag, shoulders are always being graded and track is always being moved. One tool does all jobs—a Gradall, built by Warner & Swasey Co., Cleveland.

Two for Three—The company's two Gradall truck-mounted units easily handle dump maintenance. As the shoulders of a dump build up, molten slag begins to work its way back under the rails. That's where the work comes in.

Using a ripper tool, the Gradall breaks up skulls and pushes them over the edge of the embankment. Larger chunks are broken and loosened to form the grade for the next roadbed. Still using the ripper, the operator breaks solidified slag between the ties. When these jobs are done, the Gradall pushes the rails to the edge of the dump, picks up loose slag and reballasts the new right of way.

Formerly, Union crews were able to clean about 550 ft of track a day. Now one unit does about 1000 ft. The Gradalls also are used in the replacement of weakened or burned-out ties and for rail aligning.

Slag between the ties has to be broken up, too

About once a month the tracks get shoved to the edge

NEITHER STORM NOR HEAT NOR CORROSION knocks out ANACONDA's 3-conductor 15kv self-supporting Aerial Cable—shown here at Shell Oil's modern new refinery at Norco, La.

GO UP TO BRING COSTS DOWN

—with AnacondA Aerial Cable

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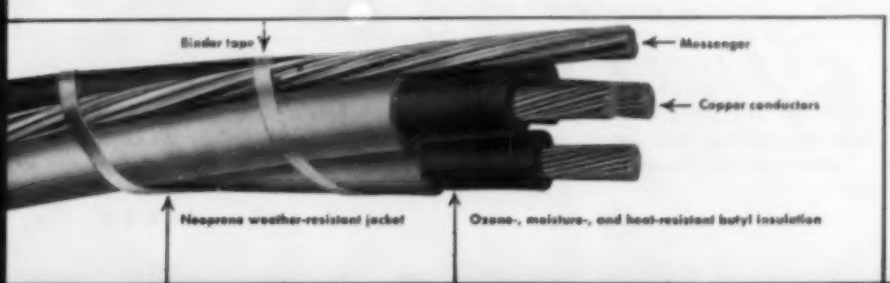

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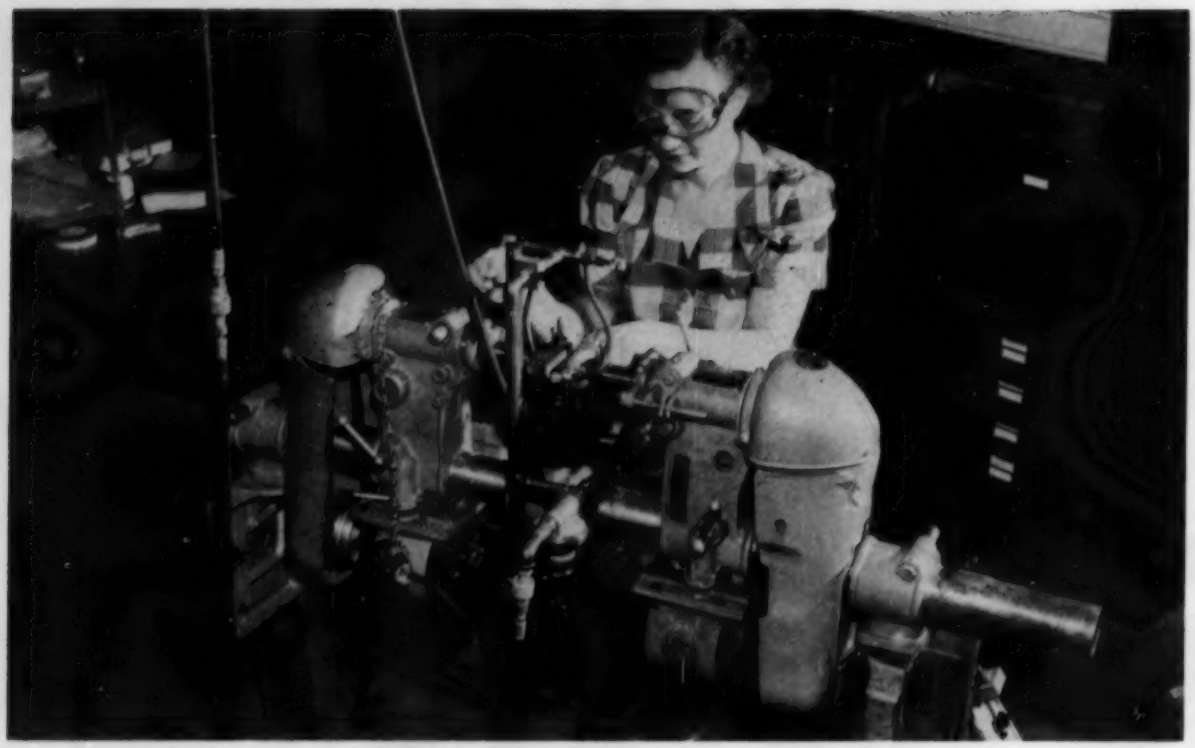


This homemade rig turns out 200 pieces an hour, an example of how . . .

Unitized Tools Keep Costs Down

CONVERTING standard power tools into unitized machine tools can make for greater profits through greater efficiency.

Such a tooling transition makes it possible for Creative Plastics Corp., Stony Brook, Long Island, N. Y., to manufacture accurate plastic levels in large quantities at minimum cost. They come in 3, 9 and 24-in. lengths.

Production Problem—In the 3-in. model, two holes have to be drilled in each end of the level so pins may be inserted to hold hooks. Tooling consists of two 14-in. Delta, high-speed drill presses mounted horizontally.

A fixture between the two spindles permits exact positioning of the workpiece. The operator places the part on the jig plate, an air-hydraulic cylinder brings it up to a specified position (with the vial bubble centered) and each end of the level is simultaneously drilled to a depth of about ¼-in. This machine turns out 200 pieces an hour and stays within a 0.0001-in. tolerance.

Tooling Enigma—In the production of the 24-in. level, an operator must insert a bubble vial into the level frame permanently, but not rigidly. To do this job, a drill press is mounted horizontally on a jig table, with the drill spindle facing across the jig at a 90-degree angle.

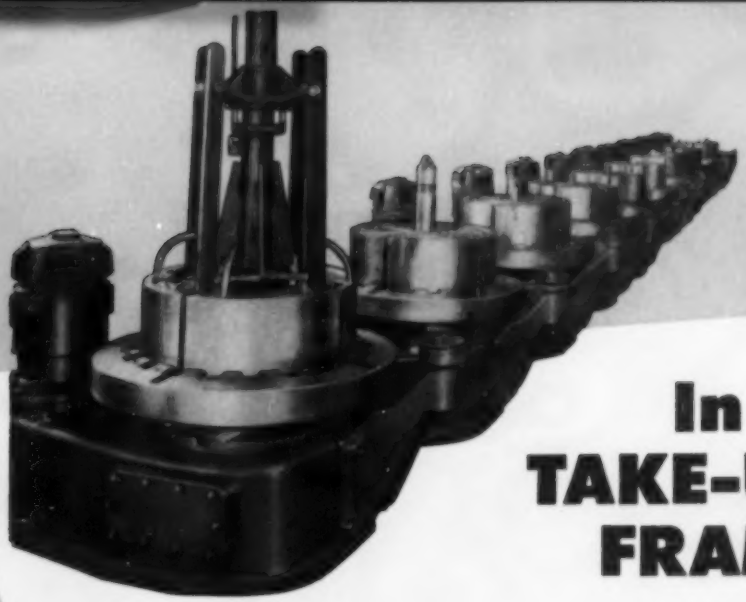
The operator places the workpiece on the jig bed and locks it in place. He sets the bubble vial insert on the level frame socket and centers the vial bubble. He then drills a hole through the frame and vial insert.

Once the hole is drilled, and with the frame still locked in place, he places a dowel pin in a small shaft that is part of the fixture. Air pressure drives the pin through the level frame and vial insert, holding the insert permanently in the frame. This tool maintains an output of 33 pieces an hour and a running tolerance within 0.001 in.

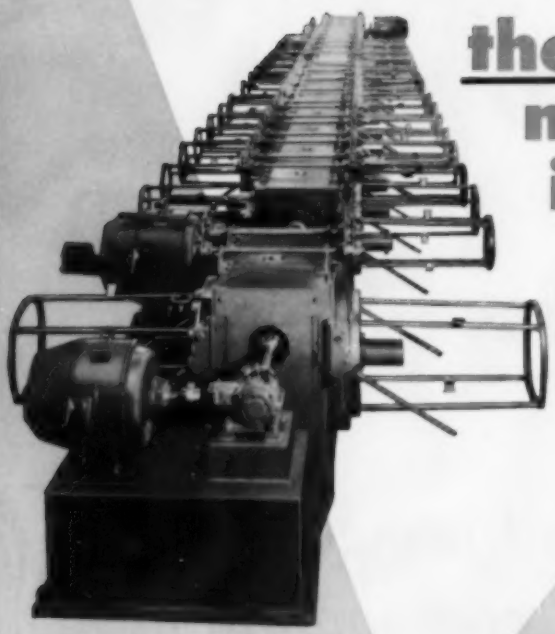
Milling Job — For the final manufacturing operation on the 9-in. level, the company relies on a spindle shaper converted to a milling machine to grind the bottom surface of the level.

An adapter arbor to hold a 2-in. end mill replaces the shaper shaft. A set of ways mounted on both sides of the arbor carries the jig holding the part horizontally across the milling cutter by air-hydraulic feed. Forced air cools the cutter blades.

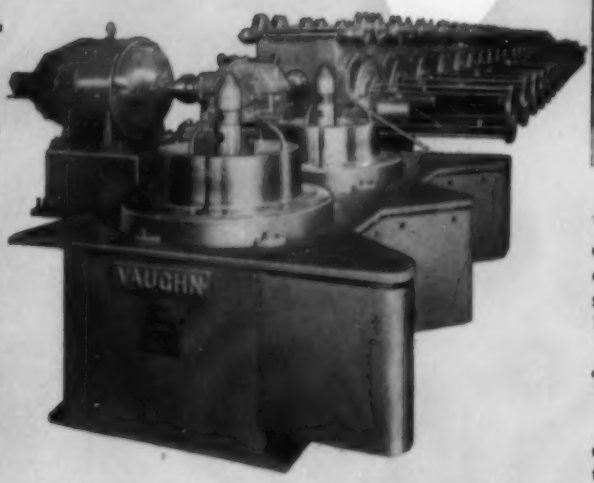
Cut depth is determined by two dial indication readings. The first reading is taken on the bottom of the part before milling; the second is taken from the milling arborshaft. These readings permit the operator to make adjustments to exact milling requirements of each part. This machine turns out 60 to 65 pieces an hour.



In TAKE-UP FRAMES



the name is- Vaughn



Vaughn Take-Up Frames incorporate the complete experience of the Vaughn organization in manufacturing wire drawing equipment of every type—to the most exacting standards of profitable performance for the customer. *We'll be glad to detail the advantages to you!*

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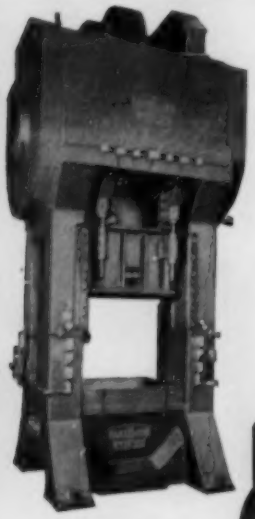
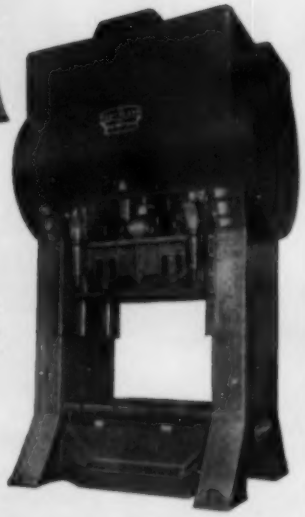
Cleveland Double Crank Double Action Toggle Press—400-ton capacity



Cleveland Single Crank Double Action Toggle Press—200-ton capacity



Cleveland Double Crank Double Action Toggle Press—200-ton capacity

YOU'LL HAVE fewer DEEP DRAW OR STAMPING rejects WITH Cleveland Toggle Presses!

The design of Cleveland Double Action Toggle Presses assures *smoothness of action, perfect timing and absolute dwell of blank-holder slide.* Powerfully constructed and having an ample over-load capacity, they consistently produce difficult deep drawings and stampings accurately. You'll enjoy their trouble-free operation and simplified maintenance. Adjustments are easy.

Cleveland Toggle Presses are designed so that when the blank-holder toggle arms straighten out, the entire blank-holder pressure is transmitted to the frame. This permits total use of crankshaft power for the drawing operation.

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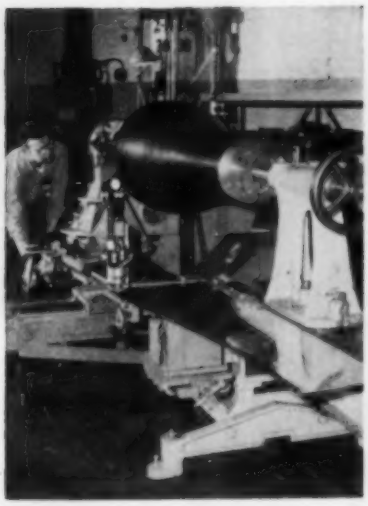


Tracer Short Cut

That's what Douglas Aircraft engineers call this unique unit. With it, they fabricate tools on a spinning lathe from a flat pattern configuration in a tenth of the time it used to take. Responses are received from the stylus and these actuate the carbide cutter. Tolerances are held to 0.005 in.

Giant Internal Gear Broach

This tool produces a 73-tooth internal helical gear nearly 6 in. in diameter and 1 in. wide in a single pass. The transmission gear is then ready for shaving. National Broach & Machine Co., Detroit, produced the tool.

Probably the largest ever made for internal helical running gears, the broach is nearly 7 ft long and weighs about 700 lb. Precision tool manufacturing and heat treating were required to produce the unusually high-speed steel broach to "tenths of a thousandth" accuracy.

Special Attachments — Broach teeth were ground from the solid on a grinding machine equipped with a special headstock, lead bar arrangement, automatic index mechanism and wheel trimmers. Teeth have a special protuberance form that provides clearance in the bottom of the gear tooth spaces for the shaving cutter.

Inside diameter of the internal gear is finished by integral rings near the end of the broach as it passes through the gear blank, thus providing absolute concentricity of OD, ID and sides of the gear teeth.

MACHINE TOPICS

By R. F. HUBER, *Machine Tool Editor*

BEHIND THE laboratory doors at Carboloy Department, General Electric Co., a group of tight-lipped research men are working on a new cutting tool material. They think it may be the tool builders' answer to high-speed machines now on the drawing boards.

The material has a cemented "oxide base." It's apparently another step on the road to ceramic tool tips.

Success—Lab tests indicate the new material gives good tool life at speeds of 2000 sfpm. Carboloy engineers ran one test at that speed on 1045 steel, annealed to 170 Brinell. With a feed of 0.005 in. and a 0.1-in. depth of cut, the tool lasted 27 minutes.

The new tool material calls for some change in tool geometry, but final, recommended shapes haven't been determined.

Its Place — Carboloy engineers are guessing that oxide-base tools may supplement carbides, like carbides supplemented high-speed steel tools some 15 years ago. One drawback to the new material: It's more brittle than carbide.

Designed and built for super-speed machining jobs, the material also may be able to drop down into the under-1000 sfpm range with some modification in tool shape. In this range it apparently would offer increased tool life.

Silence — The engineers aren't saying when the new material will be ready for commercial use. Neither are they talking about the physical properties, nor, for that matter, what "oxide" makes up the oxide base.

They give one hint on possible costs: The material is made from inexpensive, abundant materials; it uses no tantalum, tungsten or cobalt, as do carbides. This can help to lower tooling costs.

Several machine tool builders plan to put the new material to work on exhibit machines at the September show in Chicago. That will be the first chance machining men have to see it.

The Same?

Carboloy's new material may be a blood brother to the aluminum-oxide ceramic tools developed at the Watertown Arsenal.

Scientists at the Arsenal's Rodman Laboratory report their material is particularly good for light finishing cuts at high speeds.

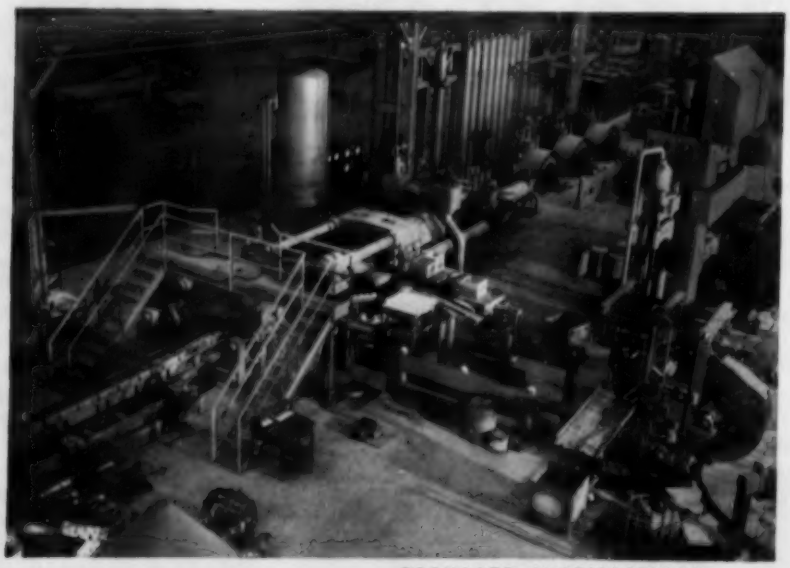
Performance—They've run tests on 4140 steel, 300 Brinell, at speeds up to 1200 sfpm and depths of cut up to ¼-in. Tool life is about three times that of carbide.

The Rodman Laboratory basic material is high-purity, high-density aluminum oxide powder. It's pressed and sintered to get the hard cutting tip. The developers report that it's tough to make a ceramic consistent from batch to batch. Two pieces of the same type ceramic may give different results on the same job.

There's another possibility for the cutter material of the future. The American Society of Tool Engineers is working on a project to develop a boride tool material.

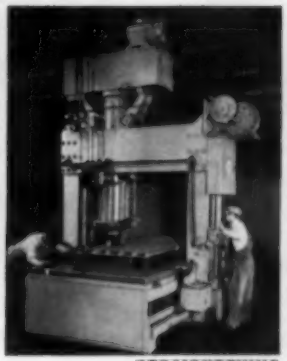
DRAWING

From a single press to a packaged installation . . .



PACKAGED INSTALLATIONS

RUBBER PAD FORMING

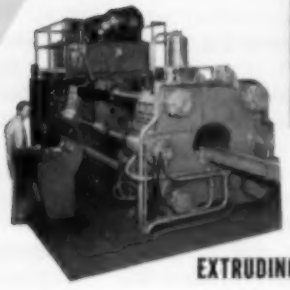


STRAIGHTENING

FORMING

PLATE BENDING

BULLDOZING



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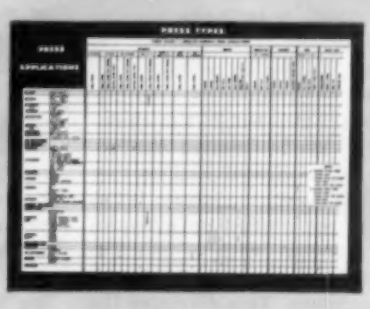

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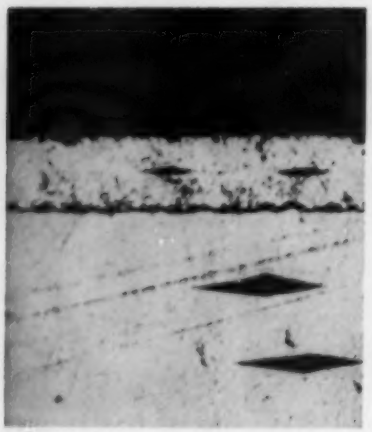


Opportunity Knocks for Gas Plating

EVERY FEW YEARS a development comes along that starts the imagination working overtime. Such is gas plating.

Today, it is mostly potential; given the right breaks, it could become important in metal plating, in refractory coatings for heat or abrasion resistance and in electronics fabrication.

Versatility — Gas plating (or vapor deposition) is being watched closely because it is one of the most versatile methods for applying coatings of refractory materials and of preparing high-purity metals. It can deposit coatings of most refractory metals at temperatures far below their melting points, or at temperatures where their vapor pressures are negligible. Coatings of a few hundredths of a mil to ¼-in. or more thick can be formed in plating times varying from a few minutes to several hours. Most vapor deposition can be carried out in a vacuum or at atmospheric pressure.

Although used to best advantage for depositing refractory metals and compounds, it also can be used with materials such as aluminum, tin, lead, iron, copper and arsenic.

Adherent—Coatings made in this way are frequently more adherent and stable under high-temperature operation than materials deposited by other methods. For this reason, vapor-deposited chromium and nickel coatings are being used increasingly for high-temperature applications, although these metals can be more easily applied by other methods.

Vapor processes also can be used to form massive metal deposits on fine wire. This produces large, dense masses of refractory metal at relatively low temperatures with no contamination from the atmosphere or container. For a number of years, this process furnished the only supply of massive titanium and zirconium of sufficient purity to be workable.

Methods—Two general gas plating methods are used: 1. Reduction or displacement. 2. Thermal decomposition.

The reduction process usually is carried out as follows: Hydrogen is passed over or through a metal halide, heated to a temperature which produces a gas mixture containing from 1 to 30 per cent by volume of metal halide vapor. This gas then passes into the coating chamber and over the specimen, reacting at its heated surface and depositing an adherent coating. Spent gas passes out of the chamber and may be treated for recovery of the unused halides.

Precoating—A variation is to first coat the object by evaporation in vacuum with a reactive metal, such as magnesium, aluminum or calcium. This displaces the metal desired as the final coating from its halide vapor.

Thermal decomposition plating is done either by high-temperature decomposition of halides and oxygen-containing compounds or by low-temperature pyrolysis of carbonyl and hydride compounds.

Apparatus—Gas plating still is mostly a small-scale operation employing batch methods, although a few high-production continuous-processing units have been built. One for the gas plating of strip is in operation at Commonwealth Engineering Co., Dayton, O.

At the other end of the scale, a setup employing laboratory glassware has been used commercially to plate metal shot-blasting nozzles. A continuous flow unit of laboratory size has been used to apply tantalum, niobium (columbium), molybdenum and tungsten coatings to iron, copper and molybdenum wires in lengths to 1000 ft.

In Common — All gas plating units require a vaporizer, a gas-tight plating chamber with a heater for the work and some means of disposing of waste gases. Most require purifying apparatus for the carrier gas.

Resistance or induction usually is employed to heat the work. External furnace heating can be used, but plating efficiency often is low because of extensive deposition on the walls of the plating chamber.

Characteristics — Properties of the coatings are those of the coating materials in bulk. The metals, with the exceptions of osmium, ruthenium, iridium and chromium, can be deposited in ductile form.

Metals sensitive to nonmetallic impurities can be made hard and brittle, and often inadvertently are.

Few articles in STEEL have created greater reader interest than "Gas Plating Offers Versatility," in the issue of Oct. 19, 1953, page 120. STEEL now presents a second article adapted from *Vapor-Plating: The Formation of Metallic and Refractory Coatings by Vapor Deposition* by C. F. Powell, I. E. Campbell and B. W. Gonser, just published by John Wiley & Sons Inc., New York.

by the addition of traces of carbon, oxygen, nitrogen or hydrogen compounds to the plating atmosphere. Boron, silicon and the carbides, nitrides, borides, oxides and most of the silicides are extremely hard and brittle. However, some of the vapor deposited silicides of tantalum and molybdenum are slightly ductile at room temperature.

Tight Bond—Coating adhesion is excellent where a physical or chemical bond is formed between the coating and the base, as in chromizing iron. Coatings so bonded can take severe deformation without spalling, provided both coating and bonding layer are ductile. Some metals, however, react with carbon or nitrogen in the base metal to form a brittle, poorly bonded interlayer.

In some instances, as in coating chromium or uranium, constituents of the base may react with the by-products of the coating reaction to leave a nonvolatile, contaminating surface film which reduces adhesion. When coating and base interact, surface cleanliness before coating is relatively unimportant.

Mechanical Bonds — When the bond between coating and base is only mechanical, as with tantalum on copper, adhesion is similar to that of electrodeposited metal. A clean surface is highly important for adherent deposits.

Ductile metals generally form the most adherent coatings on the widest variety of bases. Brittle materials usually form satisfactory coatings only on bases which approximate them in coefficients of expansion and which are not subject to deformation. Vitreous coatings of brittle materials usually exhibit greater strength and resistance to thermal shock than crystalline deposits.

Key Temperature—Of the factors that influence the deposit, specimen temperature seems to be most important. Low temperatures favor fine crystalline deposits. Virtually amorphous deposits of boron, silicon dioxide and boron carbide have been obtained at the lowest deposition temperatures, and deposits of metal crystals several millimeters in diameter at high temperatures. At high temperatures, single-crystal deposits of some materials can be obtained on a single-crystal base.

Concentration of reactants in the plating atmosphere and pressure likewise affect crystallinity. Coatings at high concentrations or pressures usually have finer crystals.

Purity of the deposit depends on the purity of the reagents. In addition to producing brittle deposits with some metals, impurities, such as oxygen, nitrogen, water vapor, oxyhalides and hydrocarbons in the coating atmosphere, frequently cause rough, discolored deposits.

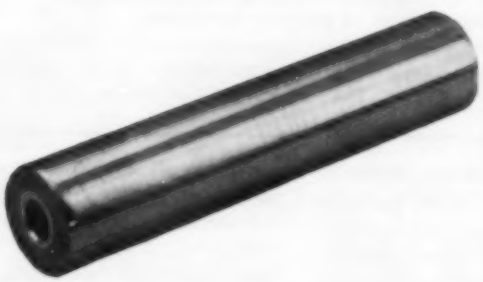
Thickness — Deposition rates vary widely. Layers of some metals can be built up by hydrogen reduction of their halides at rates of 0.0003 to 0.0026 ipm. Rates are much lower with other methods, particularly thermal decomposition.

Thickness of deposits may be varied within a wide range, from 0.001 to 0.5 in. The average deposit runs from 0.001 to 0.01 in.

Uniform coating depends chiefly on uniform specimen temperature and the uniform rate of supply of plating atmosphere to all surfaces. Plating efficiency varies greatly—from 10 to 80 per cent.

Many Uses—A wide variety of products and materials has been

Gas Plating Goes To Work



Massive nickel plating on the exterior of ¼-in. aluminum tubing. The aluminum was chemically removed and high-pressure nickel tubes were fabricated in this fashion

Tire mold on which gas plated nickel is to be deposited. Over 13 lb of nickel were laid down in 1 hour on this mold. The nickel deposit has a tensile strength of more than 90,000 psi

Commonwealth Engineering Co. of Ohio

coated by vapor deposition. Adherent, nonporous deposits have been obtained on copper, nickel, tantalum, molybdenum, tungsten, alloy steels, iron, graphite, porcelain, alumina, fused silica, Pyrex glass and sintered carbide. Metals have been coated on nonmetals and vice versa.

In addition to wire, rod, tubing and strip, articles such as thermocouple wells, die blocks, nozzles, crucibles, x-ray tube targets and electronic-tube elements have been coated. Porous, electrically conductive coatings have been applied to porous ceramic bodies, and ceramic particles have been given metallic coatings to improve the cermet bodies containing them.

Few Uses—These processes have had only limited commercial application. Siliconizing of iron in a silicon tetrachloride-hydrogen atmosphere has been used by the Duriron Co., Dayton, O., to improve corrosion resistance. Carbonyl decomposition for producing metallic coatings, chiefly of nickel, has been used by the Commonwealth Engineering Co.

Gaseous chromizing with chromous chloride was used in Germany during World War II to extend the supply of scarce, corrosion-resistant materials. Originally known as the B.D.S. process, it has been applied commercially by Diffusion Alloys Corp., New York, and Metal-Gas Co. of England. Commercial chromizing also is probably practiced in Germany and France.

Fansteel Metallurgical Co., North Chicago, Ill., produces siliconized molybdenum articles on a custom basis. The siliconized molybdenum is obtained by treating molybdenum in a $SiCl_4$-H_2 atmosphere to produce a coating of molybdenum disilicide.

Potential — Sometimes a part fails through progressive chemical attack that starts at localized overheated areas. Vapor plating with a thin film of a high-melting material resistant to oxygen, nitrogen and water vapor would help to avoid this. Specific applications are linings for combustion and exhaust chambers, coatings for gas-turbine blades, valve and cylinder coatings for internal-combustion engines, linings for heat exchanger and regenerator elements, coatings for hot rolls and heating elements.

Hard, erosion-resistant surfaces are required in some applications. The carbides, nitrides and especially borides would be possible coating materials.

Among applications would be linings for solid-fuel-injection nozzles and shot-blasting nozzles, bearing surfaces, die facings, coatings for chains and wire subject to severe abrasion.

More Uses—Applications where vapor deposition might expedite or make possible the fabrication of parts are: 1. Thin, small elements for thermocouples, resistance thermometers, transistors. 2. Vacuum and phototube elements of improved electrical or optical properties. 3. Tubes, sheets and massive quantities of hard, refractory materials. 4. Corrosion-resistant chemical ware and piping.

Ductility and Oxidation Resistance of Vapor-Deposited Coatings

	Ductility	Oxidation resistance
Beryllium	1-2	4-5
Boron	3	3
Aluminum	1	5
Carbon	3	4
Silicon	3	3
Titanium	1	3
Zirconium	1	3
Hafnium	1	3
Vanadium	1	4
Niobium (Columbium)	1	5
Tantalum	1	5
Chromium	2	2-3
Molybdenum	2	5
Tungsten	2	4
Iron	1	5
Cobalt	1	4
Nickel	1	4
Rhenium	1	5
Ruthenium	3	4-5
Rhodium	1	1
Osmium	3	5
Iridium	2-3	4
Platinum	1	1
Copper	1	5
Germanium	3	4-5
Tin	1	
Lead	1	
Arsenic	2-3	5
Antimony	2-3	5
Bismuth	1	
Thorium	1	3-4
Uranium	1	5

	Ductility	Oxidation resistance
Carbides		
Boron	3	3
Silicon	3	2
Titanium, Zirconium, Hafnium	3	3
Vanadium	3	
Niobium, Tantalum	2-3	3
Chromium	3	3
Molybdenum, Tungsten	3	5
Uranium		5
Nitrides		
Boron	3	3
Titanium, Zirconium	3	3
Vanadium	3	
Niobium, Tantalum	3	5
Borides		
Aluminum	3	3
Titanium, Zirconium	3	2-3
Vanadium	3	3-4
Molybdenum	3	3
Tungsten	3	3-4
Silicides		
Titanium, Zirconium	3	4
Niobium	2	4
Tantalum	2	3
Molybdenum	2	1
Tungsten		1-2
Iron	2	4
Oxides		
Aluminum	3	1*
Silicon	3	1
Zirconium	3	1*
Chromium	3	1*

Porous coating. Some oxidation of base through the coating.

Ductility: 1. Capable of being severely worked without failure. 2. Capable of slight deformation, or consisting of ductile crystals fragilely bound togther. 3. Incapable of being worked; of glasslike brittleness.

Oxidation resistance: Classed by temperature at which air would cause severe erosion or failure of the coating within a few hours. 1. Above 3090°F. 2. 2640 to 3090°F. 3. 2010 to 2640°F. 4. 1470 to 2010°F. 5. 930 to 1470°F.

* *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.*

"Competitive wheels have never equalled G Bond wheels on our jobs." This Massachusetts tool manufacturer further reports he considers G Bond wheels as maximum load production wheels, extremely free cutting, requiring little dressing and giving very long life. His requirements are precision grinding hard steel to a very high finish, and to parallel tolerances of .0001".

Grinding precision spur gears of S4E 8620 steel, hardened to 59-63 Rockwell C, this Maryland pump and motor builder thoroughly tested G Bond wheels against other makes. He reports that G Bond wheels cut cooler, hold form much better, last 50% longer due to less frequent dressing, and are easier on diamonds.

Jigs, fixtures and other parts of miscellaneous steels, besides some of cast iron, are the jobs on which G Bond segments are used by this Ohio tool and gage maker. He credits the G Bond segments with giving a better finish, with less dressing, than any he previously used.

Better surface grinding for you... G BOND users' reports prove it!

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Reports from surface grinding customers on the performance of G Bond wheels sound pretty much alike. That's logical, because each customer is getting exactly the advantages he's looking for — *freer, cooler, faster cutting action . . . heavier cuts without burning . . . closer tolerances and smoother finishes . . . easier dressing and more pieces per dressing . . . more work, and more kinds of work, per wheel.*

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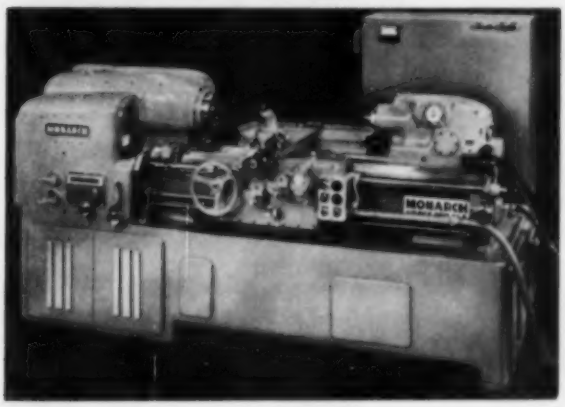
Toolmaker's Lathe Cuts Setup and Turning Time



The Series EE, Model 1000 machine features an all-electric speed control mechanism; cutting speed is infinitely variable through four overlapping ranges, forward or reverse, from 25 to 2000 rpm.

To improve work accuracy and finish, the lathe is equipped with built-in constant surface cutting speed. The apron of the unit provides power rapid traverse to both carriage and cross slide. Control is by longitudinal and crossfeed friction levers. Power for rapid traverse is supplied by a motor-driven unit with a safety clutch to prevent jamming.

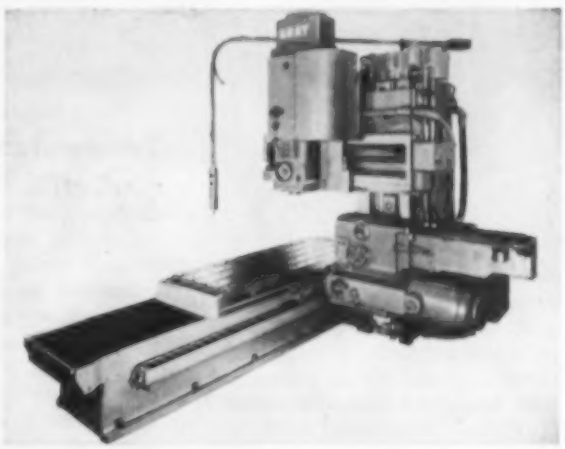
The two-speed tailstock has hydraulic clamping and unclamping. Tailstock spindle travel is by hydraulic power with finger-tip control. *Write*: Monarch Machine Tool Co., Sidney, O. *Phone*: 2-1381

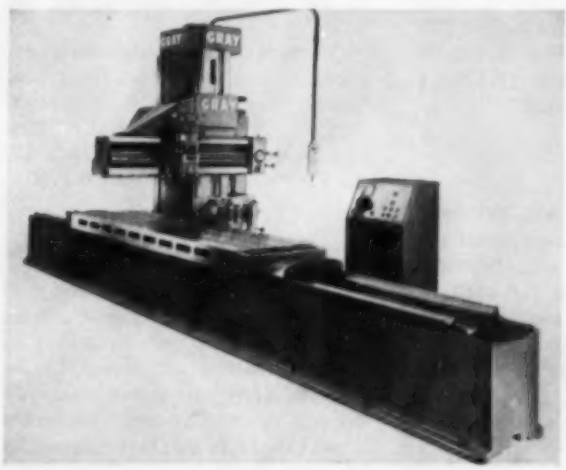
Machine Tools Redesigned for Greater Production

The Handymill—Here is a rigid, production machine that falls between the smaller knee and column-types and the larger planer-type mills. Its table is 36 x 96 in. It has a 25-hp non-swiveling milling rail head and a 25-hp boring side head. Table feed range is ½ to 200 ipm; head feed range is ¼ to 100 ipm.

Features include: Automatic indexing for table and heads, feed and traverse control from a pendant, way guards to prolong bearing accuracy and Hydro-lock, a hydraulic clamping force automatically applied to heads and quills. Feed and traverse are controlled from a pendant, eleminating levers on the rail. A chip conveyor reduces clean-up time.

Spindle speeds range from 10 to 1000 rpm. Oversize square locks are provided on housings and rail to absorb the heaviest cutting thrusts in forward or reverse.





The Universal Planer—This new 36 x 120-in. planer cuts on the forward and reverse strokes at heavy feeds with instant reversals; it finish planes while it rough double-cuts; and it planes crosskeyways and corner chamfers without extra setting. The machine uses carbide tips in holders or conventional planer tools.

Table speeds range from 30 to 400 fpm. Feed range is in 64 increments from 0 to 1 in. A 25 to 50-hp variable voltage drive powers the unit.

Features include: Nonmetallic table ways, space-saver drive with floating shaft, safety stop and table replacer, loop lubrication, square lock rail and column and improved head design.

Maximum planing width is 38 in. Maximum planing height is 37 in. *Write*: G. A. Gray Co., 3611 Woodburn Ave., Cincinnati 7, O. *Phone*: Woodburn 1-6100

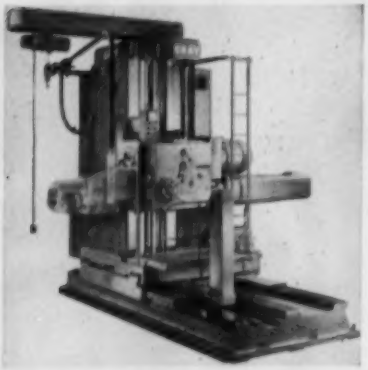
NEW PRODUCTS and equipment

Horizontal Boring, Drilling, Milling Unit

The ever-present pendant station of the Model 650 machine features dial control of spindle speeds within any range and automatic control of feed and traverse.

Hardened and ground steel ways form ideal mating surfaces for nonmetallic bearings. The machine uses optical measurement; precision settings are read at a glance on large ground glass screens. A power draw bar provides pushbutton convenience for securing tools and cutters. A handling crane of 2000-lb capacity is available.

Specifications: 4.5 to 900-rpm spindle speed range; 40-hp spindle



motor; 5-1/16-in. diameter bar; 60-in. bar travel; 72-in. vertical head travel; 96-in. column travel on runway; 24-in. column cross-travel. *Write:* G. A. Gray Co., 3611 Woodburn Ave., Cincinnati 7, O. *Phone:* Woodburn 1-6100

Boring Cutter

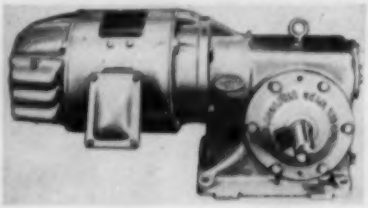
All blade locking and adjustment mechanisms are totally enclosed during cutting. It is particularly applicable to production boring of cast iron.

In small diameter units the number of blades can be increased. This number is determined by feed rate, chip load and bore size and may vary from 6 to 12 carbide-tipped cutter blades per cutter. *Write:* Ingersoll Milling Machine Co., Rockford, Ill. *Phone:* 3-6461

Worm Gear Reducer

This motorized unit is a self-contained right-angle worm gear-motor for severe industrial use. Gearing and bearings are oversize for maximum strength.

A flexible coupling connects the motor and wormshaft, eliminating



the problem of alignment. These units are available in sizes from 1 to 50 hp, with reduction ratios from 3⅝:1 to 90:1. *Write:* Philadelphia Gear Works Inc., Erie Ave. and G St., Philadelphia 34, Pa. *Phone:* Garfield 6-9400

Temperature Alarm Paint

At 400°F, Temp-Alarm GA-1 changes from the original mustard yellow to maroon. Applied to mixing tanks which hold large quantities of molten metal, the paint will warn when the firebrick lining is worn.

The paint is made with a silicone resin base. The scheduled color transformation will develop more slowly at lower temperatures, but no permanent color change will take place before 375° F. *Write:* Tempil Corp., 132 W. 22nd St., New York 11, N. Y. *Phone:* Oregon 5-6610

Gas Generator

The Atmo-Gen AM-300 is a complete unit with equipment necessary to produce a high-quality, low-cost atmosphere for such operations as bright hardening, dry cyaniding, copper and silver brazing, nitriding and sintering. It is rated at 300 cubic feet per hour of cracked ammonia atmosphere.

The steel cabinet encloses an

electric-tube type furnace with temperature control, a catalyst-filled alloy retort, the required piping, flow control and metering equipment. *Write:* Hevi Duty Electric Co., Milwaukee 1, Wis. *Phone:* West 3-2756

Power Screw Drivers

These torque-controlled, portable power screw drivers and nutrunners feature a new type magnetic "one-shot" clutch which gives precise control of fastener tightness. The clutch disengages fully the instant proper torque is

attained, and stays disengaged until the driver is removed from the work.

Thirteen models, including reversible and nonreversible types, handle from No. 4 to ¾-in. screws. *Write:* Chicago Pneumatic Tool Co., 6 E. 44th St., New York 17, N. Y. *Phone:* Vanderbilt 6-1700

Air-Seal Cycle-Timer

The Timing Rotorseal, designed for presses and other machine tools, combines two functions in one mechanism; it serves as an air seal and cycle timer at speeds to 500 rpm. The need for extra shaft space formerly occupied by

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Cutting with VICTOR Model 300 Series Torch Butt and Model 2450 Cutting Attachment, cuts to approximately 8".

The versatility of VICTOR torches means you can buy exactly what you need for today's job, then add other nozzles, tips and attachments as required. Your equipment grows with your needs; stays custom-fit to your work. For example, here are a few of the 34 standard attachments for VICTOR 300 Series Torch Butts.

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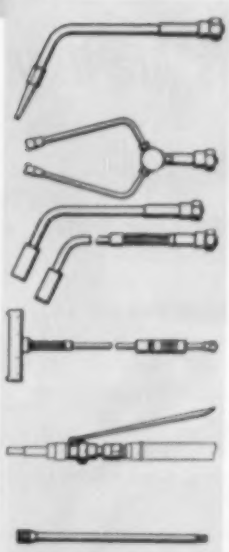

Welding . . .
Here's one of 10 standard single-tip nozzles available for general welding and preheating.

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uninterrupted service
H & S Speed Reducers Are Used

The above illustration shows an H & S reducer driving the main pulling bridle in a Wean continuous tower type annealing line for tin plate at a large steel corporation. It replaces the batch annealing process and produces a much more uniform product . . . with a great saving in floor space. H & S reducers were selected for their excellent construction and reliability (*freedom from down time*).

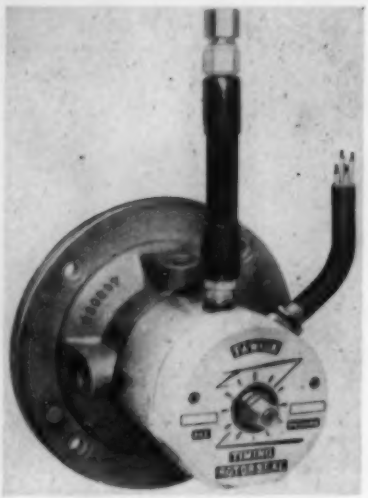
This is only one instance where H & S is helping industry do a better job . . . our engineering department is always at your service.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 Hamilton Avenue
Cleveland 14, Ohio

Send note on Company Letterhead for 488-Page Catalog 49

the cam limit switch, sprockets, timing chain and mountings is eliminated.

Timing of the operating cycle

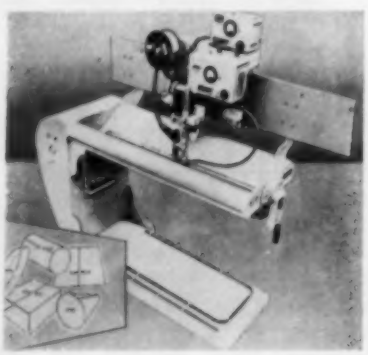


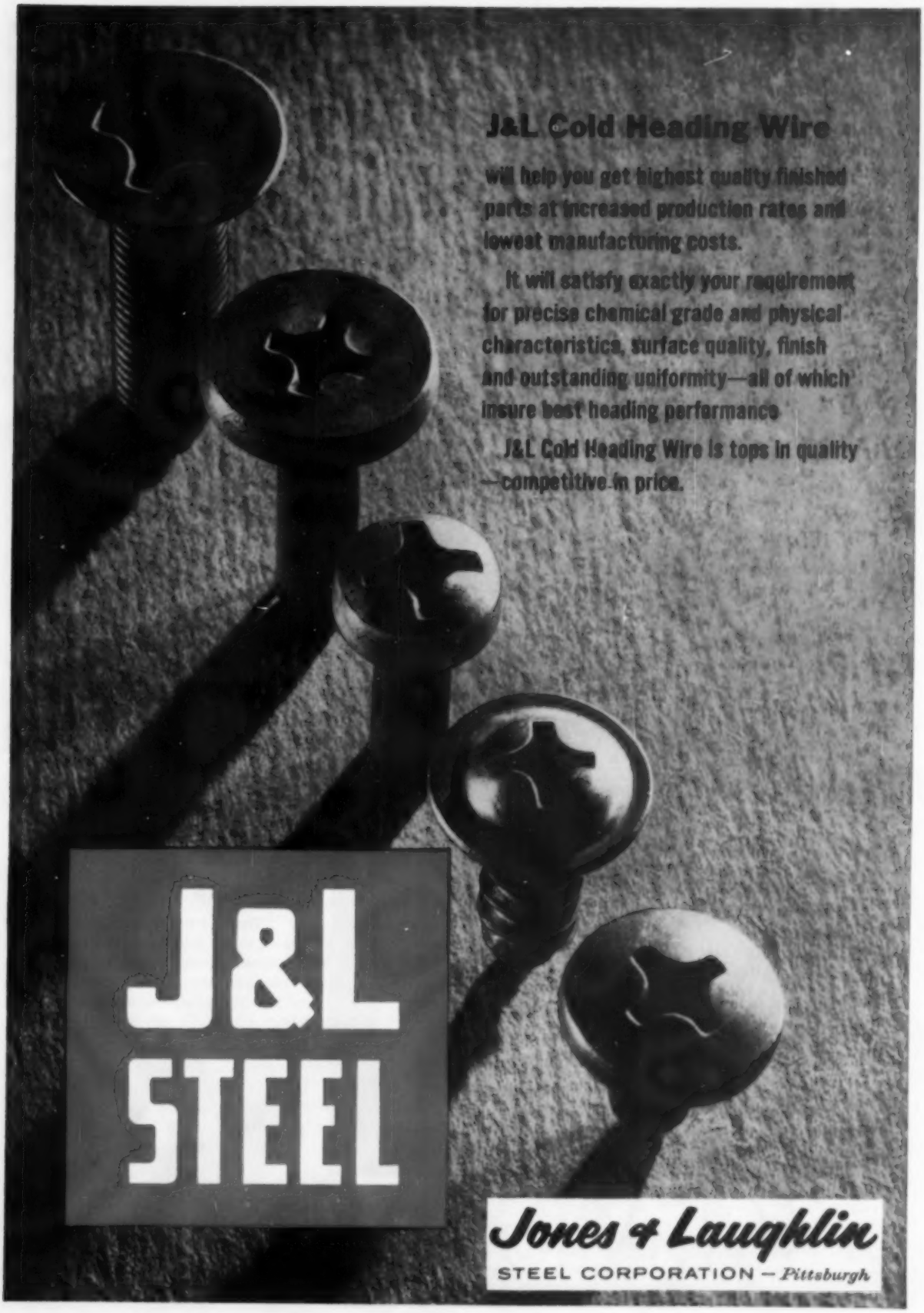
is done by multiple limit switches which control air pressure to the clutch and brake. *Write:* Fawick Airflex Division, Fawick Corp., 9919 Clinton Rd., Cleveland 11, O. *Phone:* Atlantic 1-2211

Welding Fixture

The Model LW Series 1000 lets you weld flat plates, sheets, cones, cylinders and boxes with any of the fusion welding automatic processes as well as hand welding. From 0.005 to 1 in. weld thicknesses are possible.

Narrow hold-down fingers pivot and are adjustable in and out. The fixture has up to six copper or steel inserts in a rotating backup mandrel and a choice of grooves. A foot pedal permits control of the fingers from any operator po-




J&L Cold Heading Wire
will help you get highest quality finished parts at increased production rates and lowest manufacturing costs.
It will satisfy exactly your requirement for precise chemical grade and physical characteristics, surface quality, finish and outstanding uniformity—all of which insure best heading performance
J&L Cold Heading Wire is tops in quality —competitive in price.
J&L STEEL
Jones & Laughlin
STEEL CORPORATION — Pittsburgh

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. . . specify the part, the metal, the finish and when needed. Shenango does the rest, and does it right! Take these printing press rolls of *centrifugally cast Meehanite Metal*. Close-grained and stronger, they are better able to resist distortion and deflection—perfect for heavy-duty, long-life performance. Shenango's specialty is quality and economy in rings, rolls, sleeves, liners, bearings, bushings, virtually any annular or symmetrical part. Get *all* the facts. Write: Shenango-Penn Mold Company, Centrifugal Castings Division, Dover, Ohio (Executive Offices: Pittsburgh, Pa.).
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COPPER, TIN, LEAD, ZINC BRONZES • MONEL METAL
ALUMINUM AND MANGANESE BRONZES • NI-RESIST • MEEHANITE® METAL

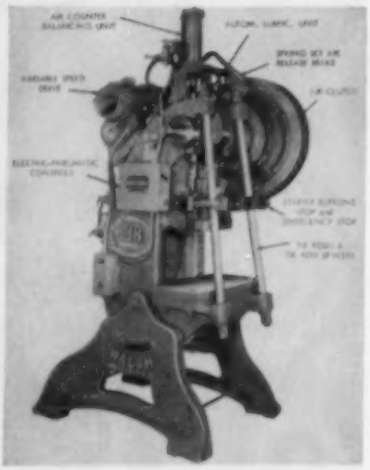
NEW PRODUCTS and equipment

sition. *Write:* Airline Welding & Engineering, 785 N. Prairie Ave., Hawthorne, Calif. *Phone:* Osborne 5-2225

Stamping Press

The Air-Clutch, Hi-Flex O.B.I. press features electric-pneumatic controls which may be set on inching, single stroke or continuous operation.

Other features include a variable



speed drive, air balancing unit, automatic lubrication unit, tie rods and tie rod spacers. *Write*: Walsh Press & Die Co., division, American Gage & Machine Co., 4709 W. Kinzie St., Chicago 44, Ill. *Phone*: Esterbrook 8-6700

Pressure Regulators

The R-90 oxygen and acetylene regulator maintains stable delivery pressure despite decreasing cylinder pressure. It weighs two-thirds less than two-stage regulators and

Here's how to eliminate crane downtime due to summer heat

Is your steel mill constantly plagued with that annual problem of increased crane downtime caused by summer heat? With ambient temperatures up to 170° F over soaking pit, open hearth, heat treating and similar areas accentuated by high summer temperatures . . . plus dust, dirt and fumes . . . it's no wonder that crane operators need frequent relief—relief that results in *crane downtime* and *lost production!*

These problems are eliminated with Dravo Crane Cab Conditioners. The crane cab conditioner maintains a summertime temperature in the cab of 80 to 85° F . . . filters out dust, dirt and fumes . . . keeps crane operators alert and efficient . . . permits them to work long periods without relief. Dravo Crane Cab Conditioners will assure regular crane operations during those summer hot spells and help maintain production.

Get complete information *today* about how Dravo Crane Cab Conditioners can eliminate these problems and save you money! Mail the coupon.

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CORPORATION
PITTSBURGH, PENNA.
Sales Representatives In Principal Cities

Dravo Corporation, Dept. B-1107
Fifth and Liberty Avenues, Pittsburgh 22, Penna.

- ☐ Please send Bulletin "Crane Cab Conditioners."
- ☐ Please send Bulletin "Cool Off the Hot Spots."
- ☐ Please have a representative call at no obligation to me.

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Company_____

Address_____

City_____ Zone____ State_____

Exterior view of screw nut machined from steel bar stock:
Cost finished
$5.60
each
Cutaway view of nut redesigned as a cored, Gray Iron casting:
Cost finished 90¢
each

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A saving of over 80% on original cost by redesigning in Gray Iron! Also, longer life and improved operating characteristics are provided by the cast part.

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Call your nearest Society member foundry and the full facilities of this association will be available to help you. Or, write direct to Gray Iron Founders' Society, Inc., National City-E. 6th Bldg., Cleveland 14, Ohio, for helpful technical and business information.

MAKE IT BETTER WITH GRAY IRON

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Here's why it pays to call in one of the more than 500 leading foundries displaying the Society symbol:

- The most recent technical and business information is available to each member through the Society to help you design better products at lower cost.
- The use of sound cost accounting procedures is recommended and encouraged among Society member foundries, assuring full value for your casting dollar.
- Improved castings result from the advanced techniques and the high sense of responsibility of Society members.

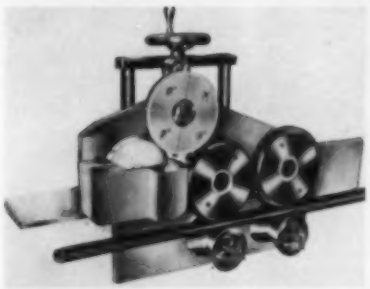
GRAY IRON FOUNDERS' SOCIETY

one-third less than single-stage units.

The pressure reducing unit is a small, self-contained capsule which can be changed without taking the regulator out of the line. *Write*: Industrial Gas Division, Liquid Carbonic Corp., 3100 S. Kedzie Ave., Chicago 23, Ill. *Phone*: Bishop 7-8000

Automatic Printer

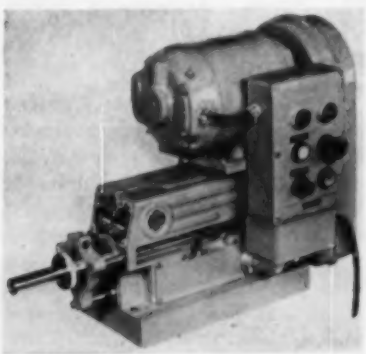
This unit can be operated in a production line, or it can be motorized for separate operation. One adjustment permits printing on various diameters. A chief advantage is its ability to print relatively large characters on small diameter surfaces.



Because of its simple construction, maintenance has been eliminated except for the cleaning of one roll and the type faces. *Write:* Jas. H. Matthews & Co., 3978 Forbes St., Pittsburgh 13, Pa. *Phone*: Museum 1-8500

Hydraulic Power Unit

This self-contained machine drills, reams, counterbores, spot faces and chamfers. Designated Model 500, the tool is completely automatic. The variable delivery hydraulic pump is an integral part of the spindle and quill.



The machine has unlimited reserve thrust at all spindle speeds, variable rates of traverse, positive depth control, thrust control and variable feed rate. *Write*: Drillmation Co., 21509 John R St., Hazel Park, Mich. *Phone*: Jordan 4-6085

Fractional Motor

For machine tool use, this totally enclosed unit is factory lubricated for ten years of service under normal conditions. It is ideally suited for dirty atmospheres.

Built for frequent start-stop and

IN COLUMBUS, OHIO . . .
Unit No. 5—Picway Station
Columbus & Southern Ohio
Electric Company
Steel Fabricated by Ingalls
Fabricating Steel is our Business
THE INGALLS IRON WORKS COMPANY
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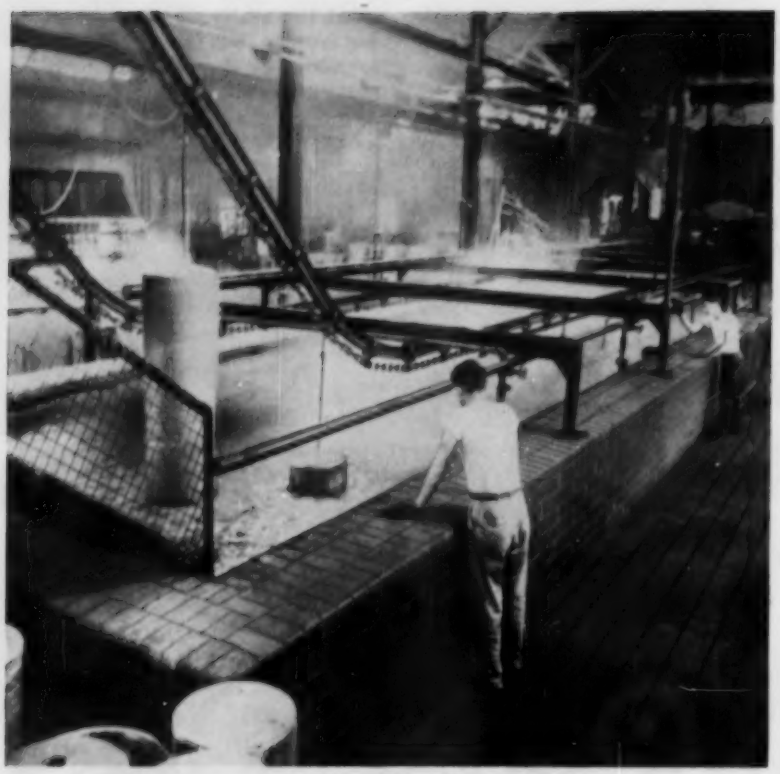
SALES OFFICES: Birmingham, New York, Chicago, Pittsburgh, Houston, New Orleans, Atlanta



PICKLING SOLUTIONS CAN'T HURT ATLAS ACID-PROOF CEMENTS

Effective pickling operations require high temperatures and concentrated pickling solutions. This necessitates critical consideration of pickling tank materials and construction. Atlas cements effectively resist the highest temperatures and the most concentrated acids used in modern pickling operations.

The Atlas Mineral Products Company has been the leader in furnishing materials for corrosion-proof pickling tank construction for over twenty years and Atlas ALKOR®, VITROBOND®, and CARBO-KOREZ® have become standards of the industry. In furnishing these corrosion-proof cements, acid-proof brick and vessel linings, Atlas has kept ahead of the field technically . . . and . . . has maintained strictest product quality control to assure that every batch has consistently high standards.

Success of Pickling Tank installations are dependent on construction. For this reason Atlas maintains engineering facilities solely devoted to pickling tank design. In turn, these are available to you locally through your Atlas Sales Engineer.

Data on ATLAS ALKOR®, VITROBOND® and CARBO-KOREZ® is provided in BULLETIN 5-2. Write for your copy.

ATLAS *CORROSION-PROOF* . . . Cements . . . Coatings . . . Vessel Linings . . . Rigid Plastic Structures and Pipe.

ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA

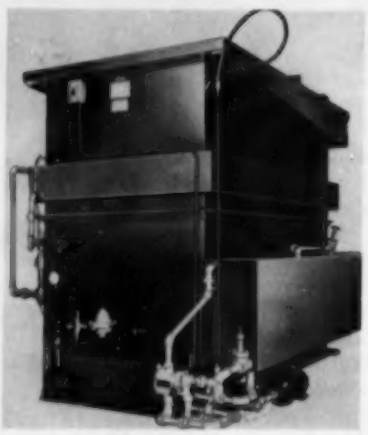
NEW PRODUCTS and equipment

plugging service, the unit has normal torque for starting, high pull-up torque for inertia loads and high breakdown torque for peak loads. In horsepower ratings of ¼, 1/3, ½ and ¾, the polyphase TEFC motor is available with speeds of 1725/1425 and 1140/950 rpm at 60/50 cycles, and in voltages of 208-220/440, 220/380 and 550. *Write:* General Purpose Component Motor Dept., General Electric Co., Schenectady 5, N. Y. *Phone:* 4-2211

Vapor Degreasers

This series of electric, gas or steam-heated units is designed for degreasing parts heavily laden with thick soil—soluble, insoluble, or both.

The machine features a double sump. One contains the heating



element; the other is a repository for the contaminated solvent. Sludge settles out here and is returned to the boiling sump for reuse. *Write:* Phillips Mfg. Co., 3443 W. Touhy Ave., Chicago 45, Ill. *Phone:* Ambassador 2-6020

Four Point Press

This 500-ton, double - geared model is equipped with a single-station, electrically controlled, drum-type, air friction clutch. It has an air-operated bar knock-out.

The bed has two air cushions with a combined capacity of 100 tons per sq in. The press has a 20-in. stroke, a 14-in. adjustment and a 40-in. shut height. *Write:*

Delivering semi-finished steel to outside storage by Ross Carrier—Kaiser Steel Corp., Fontana Works, Fontana, California.

Here's production flow ingenuity...

Kaiser Steel's 1 2 3 Operation!

1 A foreman calls for material over a two-way radio.

2 Immediately a Ross Carrier rushes into action . . . locates the material.

3 Loaded in seconds, the Ross Carrier is on its way to delivery.

No hold-up of production flow at Kaiser Steel. Blooms and slabs of semi-finished steel are rushed at a moment's notice to specialty mills for treatment. Four highly maneuverable Ross Carriers, equipped with two-way radio, have greatly reduced rail hauling within the plant site . . . have made operations between conditioning yards, storage yards and the mills, a fast, *modern* operation.

CLARK® EQUIPMENT

Industrial Truck Division CLARK EQUIPMENT COMPANY, Battle Creek 26, Michigan

FREE—a 16-page idea book! Gives you 21 industrial applications of the Ross Carrier—profitable ideas that you can use in your own business. Just tear out this coupon and attach to your letterhead. We'll rush you a copy with no obligation.

2 Stainless Parts...

made to the same specs... *but what a difference!*

Tool life increases 33%

This shaft winds the main spring that powers parking meter clocks. When produced from ordinary Type 303 Stainless, machinability was a constant problem . . . tool life was short. Then the company made just *one* change—to Carpenter Stainless No. 8 (Type 303). Now machines run ⅓ longer before tools have to be removed for resharpening.

Unit costs go down

In addition to the savings gained by longer tool life, the uniform, free-machining qualities of Carpenter No. 8 (Type 303) have helped make this job more economical. Now, material can be run at a higher speed. Close tolerances are more easily held.

Top corrosion resistance obtained

Although machinability was the prime factor for changing to Carpenter No. 8, the shaft had to be corrosion resistant to provide dependable performance when exposed to varying atmospheres in all parts of the country. And Carpenter Stainless No. 8 assured this property.

This is just one example where the difference in Carpenter *quality* and dependability pays off. It's a difference that can add up to speed, performance and profits right in your own plant. See for yourself—specify Carpenter on your next order for Free-Machining Stainless.

take the problems out of production

. . . change to Carpenter STEEL

Free-Machining Stainless

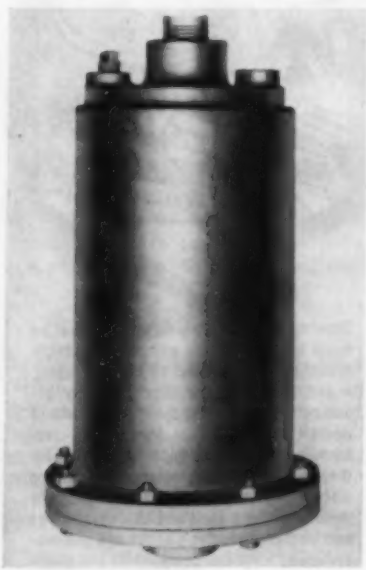
IMMEDIATE DELIVERY from local warehouse stocks!
The Carpenter Steel Co., 139 W. Bern St., Reading, Pa.
Export Department: The Carpenter Steel Co., Port Washington, N. Y.—"Carsteelco"

Cleveland Punch & Shear Works Co., 3917 St. Clair Ave., Cleveland 14, Ohio. *Phone:* Henderson 1-1911

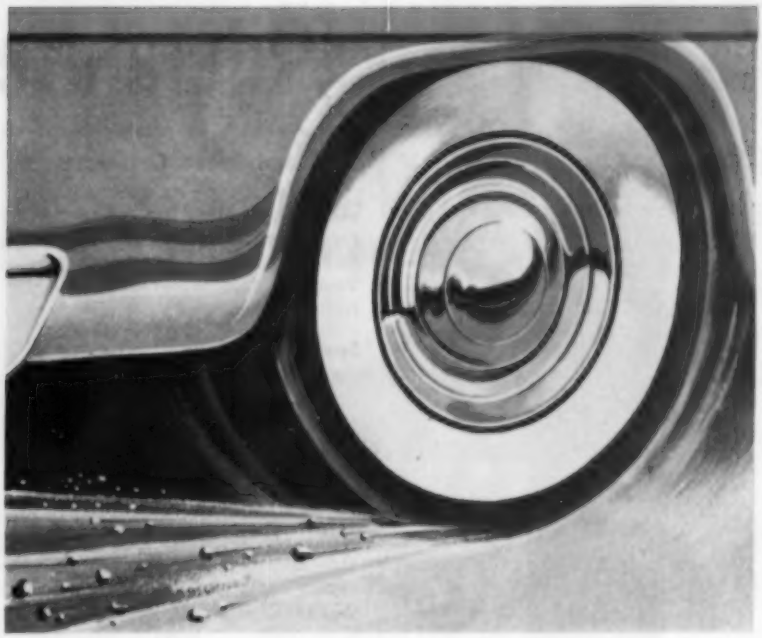
Compressed Air Separator

The Textite Air Separator effectively cleans compressed air of water, oil, dirt, scale, cinders and other elements harmful to equipment.

The unit has no moving parts to wear, or filter elements which must be cleaned or replaced. Centrifugal action, jetting, sudden ex-



pansion, capillary attraction and scrubbing remove contaminants. *Write:* Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill. *Phone:* Lafayette 3-0800



when 150 200 250 300+ horsepower

paws the ground

forgings must bear the brunt of modern power!

• Modern cars, *powerful, responsive,* stress metal parts as never before.

For safety, for economy, critical parts should be forgings, fully trustworthy as to soundness and fatigue properties. Engines, transmissions, running gear serve more dependently when forged components are used.

Throughout industry manufacturers are learning that nothing is so indispensable as a forging — because a forging is trustworthy in service — because it has soundness that reduces costs for inspection, machining, rejections, and replacements. Send for the booklets, explaining these advantages and telling how you can have a Forging Engineer help you make economy studies revealing ways to improve your product or your process with forgings.

closed-die **forgings** for metal you can trust

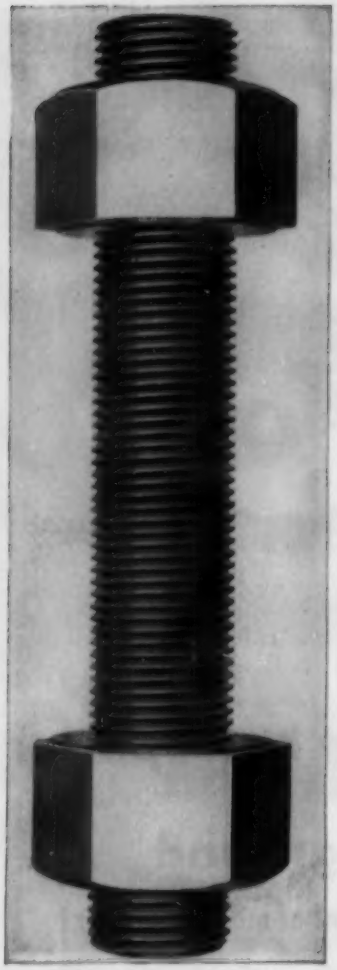
DROP FORGING ASSOCIATION

605 Hanna Building • Cleveland 15

Symbolic emblem of the Drop Forging Association

What is a FORGING

Attach this advertisement signature to your letterhead and mail to Drop Forging Association to receive booklet "What is a Forging?" ☐ or "Management Guide to Use of Forgings". ☐ Check title or titles desired.



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***Special* BOLTS**
***and* STUDS**

Send your Specifications to

ERIE

40 years' experience in making special bolts, studs, nuts for specific job requirements.

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REPRESENTATION IN PRINCIPAL CITIES

NEW Literature

Write directly to the company for a copy

Feed and Speed Calculator

This slide-type calculator provides ready answers to carbide tool users for recommended feeds and speeds and other data. Willey's Carbide Tool Co., 1340 W. Vernor Hwy., Detroit 1, Mich.

Speed Reducers

Details are given on the new Line-O-Power units—engineering manual LP No. 3, 40 pages. Foote Bros. Gear & Machine Corp., 4545 S. Western Blvd., Chicago, Ill.

Thread-Rolling Attachments

Covered are five sizes of Lanroll attachments for automatic screw machines or lathes—bulletin G-96-1, 12 pages. Landis Machine Co., Waynesboro, Pa.

Cold Spinning Machine

Described is the new Hydrospin which has the capacity to cold spin contoured hollow cones and tubes up to 42-in. in diameter and 50-in. long—catalog M-1873-2, 26 pages. Process Machinery Division, Cincinnati Milling Machine Co., Cincinnati 9, O.

Quenching Oil

Sun Quenching Oil Light is described—technical bulletin 37, 1 page. Sun Oil Co., Philadelphia 3, Pa.

Oil Seals

"Clipper Oil Seal" covers the selection, application and installation of this product—28 pages. Johns-Manville, 22 E. 40th St., New York 16, N. Y.

Heating Equipment

Bulletins are offered on 5, 10, 25 and 50-kw induction heating units; motor generator induction heating equipment; high-frequency motor generator sets and a 3-kw induction heating unit. High Frequency Heating Division, Lindberg Engineering Co., 2444 W. Hubbard St., Chicago 12, Ill.

Commercial Lockbolts

Specifications and applications of these quick, high clinching, permanent fasteners are given—8 pages. Townsend Co., New Brighton, Pa.

Metering Steam to Furnaces

Described is the Shuntflo meter used to maintain the most efficient ratio of steam to fuel oil in open-hearth furnaces—application memo

Making a
MARKED IMPROVEMENT
in BOX MARKING

Showing a hosiery manufacturer how he could mark his boxes with variable detail in half the time required by hand stamping—and get far better imprint quality besides—typifies the way the Markem Method works. Markem studies the needs—recommends the right machine, type and ink for the job, follows up with installation, operator instruction, maintenance and supply. In marking textiles, tools and hardware; shoes and leather products; plastics and pharmaceuticals; electrical components and clothing—the Markem Method results in better marking. Find out how it can benefit you, by writing Markem Machine Co., Keene 38, New Hampshire.

MARKEM ...TO MAKE YOUR MARK

NEW LITERATURE

B-I-F K28, 2 pages. Builders-Providence Division, B-I-F Industries Inc., Providence, R. I.

High Strength Steels

"Design Manual for High Strength Steels" is a working handbook for engineers and architects—publication ADVL-215-54. U. S. Steel Corp., 525 William Penn Place, Pittsburgh, Pa.

Hydraulic Quality Tubing

Advantages, uses and working data for SAE hydraulic-quality, low-carbon steel tubing are given—bulletin 39, 6 pages. Superior Tube Co., 1585 Germantown Ave., Norristown, Pa.

End Dumping Attachment

A hydraulically operated attachment for low-lift platform trucks, designed for automatic dumping of skid boxes or racks, is described. Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, O.

Packaging, Carloading Guide

Here is information on strapping containers, bracing open-top and closed freight cars and barricading car doorways to protect all types of packaged and bulk commodities—44 pages. Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.

Roller Conveyors

The Series 60 medium and heavy duty units are described—catalog 60A, 20 pages. E. W. Buschman Co., Clifton and Spring Grove Ave., Cincinnati 32, O.

Sand Blast Room Floor

Described is the Vacu-Blast "Waffle" floor sand blast room which requires no pit or excavation for automatic abrasive return—bulletin P-4, 4 pages. Vacu-Blast Co. Inc., Belmont, Calif.

Precision Coring Process

"McCannacore," a new method for forming intricate passageways in light alloy castings, is described—6 pages. McCannacore Division, Hills-McCanna Co., 3025 N. Western Ave., Chicago 18, Ill.

Protective Coatings

"Comparative Properties of Protective Coatings" covers 14 coatings used to protect equipment, walls, beams and ceilings in plants where fumes and industrial atmospheres cause corrosion—19 pages. Atlas Mineral Products Co., Mertztown, Pa.

Here's why you should talk to LEVINSON

. . . about your fabricated steel requirements—

Whether you need fabricated furnace steelwork or a simple beam and column job, you can be sure when your steel is fabricated at Levinson, it will fit together as easy as an erector set.

Levinson will be meticulous about delivering your steel when promised.

Every pound of Levinson's large stock of steel is under roof and Levinson can fabricate almost any job from stock when your requirements are rush.

Levinson's engineering "know how" helps in a hundred ways to make sure you get a perfect job.

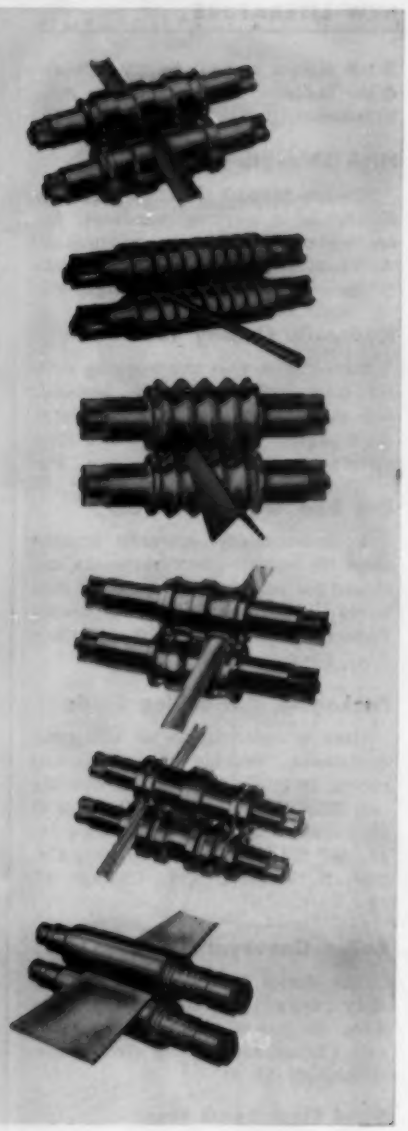
Some of the jobs going through our plant in recent months include fabricated steel for—

School buildings • Apartment houses • Office buildings • Sintering plants • Power plants • Coal preparation plants • All types of industrial and commercial buildings • Coke oven steelwork • Industrial furnace steelwork • Conveyor steelwork • Chutes, hoppers, bins, trough sections • Platforms, galleries, soaking pit covers, annealing boxes, turntables for rotary furnaces.

founded 1902

the LEVINSON STEEL COMPANY

22nd & Wharton Sts., Pittsburgh 3, Pa.
Phone HUbbard 1-3200



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. . . Rolls that are sound, long-wearing . . . rolls cast to the right hardness, chill depth, heat resistance . . . iron, alloy iron and steel rolls that you can depend upon to give long tonnage life.

So, for rolls that meet your specifications for soundness and precision be sure to specify National Rolls. You'll be glad you did.

THE NATIONAL ROLL & FOUNDRY CO.
AVONMORE, PENNSYLVANIA

Specialists in Iron, Alloy Iron and Steel Rolls, Carbon, Alloy and Manganese Steel Castings

STEEL

July 11, 1955

Market Outlook

RISING COSTS are in store for the metalworking industry.

They'll stem from the wage and price increases in the steel industry.

U. S. Steel Corp. says the additional cost of steel for a popular-priced automobile will be about $15, for a $300 refrigerator, 90 cents, and for building and equipping a six-room house, $19.

ENDLESS—But the additional costs won't stop there. Almost all other goods and services will go up, too. The tire manufacturer supplying the auto industry will find the cost of his machinery higher because the steel for making it will cost more per pound. So, the tire maker will pass the higher costs along to the auto manufacturer. Meanwhile, other suppliers to the auto industry will have similar experiences, and everything the auto industry buys will cost more. Not only will higher materials prices be passed on but so will higher labor costs. Industry in general will have to increase wages.

UNIVERSAL—So, the higher costs that the auto industry will face will be confronting refrigerator makers, the construction industry—and everybody else.

It spells another round of inflation. For the last year, prices—as registered by the U. S. Bureau of Labor Statistics index—have been steady at the level to which they declined when business dropped off in early 1954.

ONE CHOICE—The steel industry (and the auto industry) had little choice but to raise wages. The labor unions keep driving for higher wages and more benefits for their members. Business is good now, and the companies don't want to be closed by a strike. They'll give as long as they can pass along the additional costs.

Some people hold the philosophy that these wage increases—even though they are passed along in higher prices—are a good thing. This is what they say: "Higher wages bring more mechanization and an easier life. Mechanization requires greater skills that pay higher wages. With more leisure time and higher wages, the standard of living rises, creating more wants and more jobs. Look how many new jobs were created when the automobile (mechanization) replaced the horse and buggy."

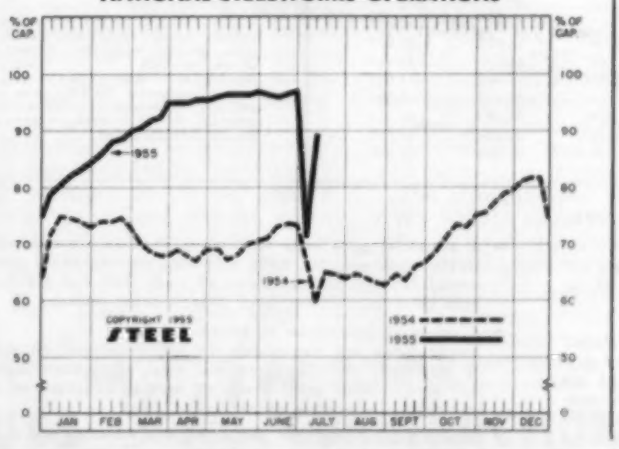
HOW MUCH—The new steel prices are an increase of 5.8 per cent, or an average of $7.35 a net ton. The wage increase that brought them was 7.5 per cent, or an average of 15 cents an hour. This marks the third consecutive year steel labor rates have gone up. Base wage now is $1.68½ an hour. For the last year it had been $1.57.

GAGES—The price increases announced thus far pushed STEEL's finished steel price index up to $125.64 a net ton.

Still going up is STEEL's price composite on steelmaking scrap. It's $37.83 a gross ton, compared with $36.50 in the preceding week.

BACK TO WORK—The 12-hour work interruption that accompanied the last-minute negotiations on wages, combined with the Fourth of July holiday, held steel operations down to 89.5 per cent of capacity in the week ended July 10. Until July, ingot output was around 95 per cent of capacity.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended July 10	Change	Same Week 1954	Same Week 1953
Pittsburgh	92.5	+18*	58.5	96
Chicago	94	+21.5*	70.5	98.5
Mid-Atlantic	87	+13*	55	97.5
Youngstown	98	+18*	60	93
Wheeling	95	+ 7*	66	97
Cleveland	95.5	+22*	56.5	103.5
Buffalo	100	+20*	61	106.5
Birmingham	93.5	— 2.5	76	101
New England	73	—12	48	70
Cincinnati	54.5	—26.5	62	100.5
St. Louis	98.5	— 7.5	55.5	85
Detroit	95	+15*	50	105
Western	101	— 4	86	105
National Rate	89.5	+18.5*	59.5	94.5

INGOT PRODUCTION‡

	Week Ended July 10	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	134.7†	106.6	142.3	89.0
NET TONS (In thousands)	2,164†	1,716	2,286	1,430

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 39

Technical Outlook—p. 87

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	July 5 1955	June 28 1955	Month Ago	June Average
(1947-1949=100)	144.9	144.9	144.8	144.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended July 5

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.526
Rails, Light, 40 lb	5.917
Tie Plates	5.275
Axles, Railway	7.500
Wheels, Freight Car, 33 in. (per wheel)	48.500
Plates, Carbon	4.675
Structural Shapes	4.517
Bars, Tool Steel, Carbon (lb)	0.430
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., Alloy	5.375
Bars, H.R., Stainless, 302 (lb)	0.422
Bars, H.R., Carbon	5.000
Bars, Reinforcing	4.963
Bars, C.F., Carbon	5.160
Bars, C.F., Alloy	11.375
Bars, C.F., Stainless, 302 (lb)	0.438
Sheets, H.R., Carbon	4.870
Sheets, C.R., Carbon	5.564
Sheets, Galvanized	7.290
Sheets, C.R., Stainless, 302 (lb)	0.553
Sheets, Electrical	$9.350
Strip, C.R., Carbon	7.493
Strip, C.R., Stainless, 430 (lb)	0.415
Strip, H.R., Carbon	5.075
Pipe, Black, Buttweld (100 ft)	15.000
Pipe, Galv., Buttweld (100 ft)	18.606
Pipe, Line (100 ft)	146.604
Casing, Oil Well, Carbon (100 ft)	154.216
Casing, Oil Well, Alloy (100 ft)	227.875
Tubes, Boiler (100 ft)	†
Tubing, Mechanical, Carbon	†
Tubing, Mechanical, Stainless, 304 (100 ft)	167.023
Tin Plate, Hot-dipped, 1.25 lb	8.533
Tin Plate, Electrolytic, 0.25 lb	7.233
Black Plate, Canmaking Quality	6.333
Wire, Drawn, Carbon	5.075
Wire, Drawn, Stainless, 430 (lb)	0.545
Bale Ties (bundle)	5.860
Nails, Wire, 8d Common	7.815
Wire, Barbed (80-rod spool)	7.139
Woven Wire Fence (20-rod roll)	16.925

†Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	July 6 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	207.76†	194.53	194.53	195.87	156.69
Index in cents per lb	5.628†	5.270	5.270	5.306	4.245

†Preliminary

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$125.64	$118.45	$118.45	$117.43	$94.36
No. 2 Fdry, Pig Iron, GT	56.04	56.04	56.04	56.04	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	37.83	36.50	35.00	27.33	36.83

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	1955 July 6*	Ago Week	Ago Month	Ago Year	Ago 5 Yrs.
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.30	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.30	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	4.55	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.40	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.25	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.25	3.40
Shapes, deld., Philadelphia	4.53	4.53	4.53	4.53	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.225	3.50
Plates, Chicago	4.225	4.225	4.225	4.225	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.225	3.60
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.225	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.225	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	4.05	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	4.05	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.95	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.95	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	5.10	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.45	4.40
Strip, H.R., Pittsburgh	4.05	4.05	4.05	4.425	3.25-3.50
Strip, H.R., Chicago	4.05	4.05	4.05	4.05	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.75	4.15-4.50
Strip, C.R., Chicago	5.85	5.85	5.85	6.00	4.30
Strip, C.R., Detroit	5.90	5.90	5.90	5.60-5.90	4.35-4.95
Wire, Basic, Pittsburgh	5.75	5.75	5.75	5.75	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.85	5.30
Tin plate (1.50 lb), box, Pitts.	$9.95	$9.95	$9.95	$8.95	$7.50

*Prices in effect prior to new schedules being issued.

SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$78.00	$78.00	$78.00	$78.00	$63.00
Wire Rods, 5/16-9/32" Pitts.	4.675	4.675	4.675	4.525	3.85

PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.42	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$38.50	$35.50	$34.50	$28.50	$40.00
No. 1 Heavy Melt, E. Pa.	39.00	39.00	36.50	23.00	33.00
No. 1 Heavy Melt, Chicago	36.00	36.00	34.00	30.50	37.50
No. 1 Heavy Melt, Valley	37.50	37.50	34.50	27.50	41.50
No. 1 Heavy Melt, Cleve.	35.00	35.00	31.50	25.50	39.50
No. 1 Heavy Melt, Buffalo	29.50	29.50	29.50	25.50	39.00
Rails, Rerolling, Chicago	55.50	52.50	51.50	42.50	47.50
No. 1 Cast, Chicago	43.50	42.50	41.50	36.00	44.50

COKE, Net Ton					
Beehive, Furn, Connisvl.	$13.75	$13.75	$13.75	$14.75	$14.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	16.75	15.50
Oven, Fdry, Chicago	24.50	24.50	24.50	24.50	21.00

Daily Nonferrous Price Record

	Price July 6	Last Change	Previous Price	June Avg.	May Avg.	July 1954 Avg.
Copper	36.00	Mar. 29, 1955	33.00	36.000	36.000	30.000
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	13.800
Zinc	12.50	June 16, 1955	12.00	12.250	12.000	11.000
Tin	95.375	July 6, 1955	95.25	93.668	91.410	96.556
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 12, 1955	22.20	23.200	23.200	21.500
Magnesium	28.50	Mar. 21, 1955	27.00	28.500	28.500	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

50-ton crane becomes 85-ton crane

with no increase in size

United States Steel's Edgar Thomson Works in Braddock, Pennsylvania, needed new and heftier crane equipment to handle larger ladles. One requirement was four new crane trolleys which were to operate on the same bridges, if possible, and in exactly the same clearances as before.

The trolleys had to be stronger but no larger than before; so ordinary steel wouldn't do. Needed, was a steel of *exceptional strength* which could be *welded easily*. Lots of alloy steels could have met the strength requirements; but USS "T-1" Steel was the *only* steel that could supply not only the required strength, but good weldability as well.

"T-1" Steel plate—in ¾" and 1" thicknesses—was used in box girders and lateral stiffener plates of the trolleys. This change increased the crane capacity from 50 to 85 tons with no increase in size.

The structure was welded with AWS E12015 electrodes. It was as easy as welding carbon steel. No stress relief was needed. And the welds developed the full yield strength of the steel: 90,000 psi. minimum.

Remember this story when you must weld very high strength parts —parts that must operate at temperatures as high as 900°F. or as low as 40°F. below zero, parts that must withstand tremendous impact abuse, abrasion or tensile stress. Then consider USS "T-1" Constructional Alloy Steel. For full particulars write: United States Steel, Room 4769, Pittsburgh 30, Pa.

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USS "T-1" CONSTRUCTIONAL ALLOY STEEL

USS

UNITED STATES STEEL

Nonferrous Metals

Washington and industry spokesmen are raising quite a fuss about a relatively small portion of the aluminum industry—scrap exports. Look for a compromise on the quota

Nonferrous Metal Prices, Pages, 132 & 133

ONLY 1.5 PER CENT of the aluminum industry—scrap exports—is causing almost as much noise from Washington as the whole basic industry did during the recent House small business investigations.

The problem seems to hinge on the interpretation of section 2 of the Export Controls Act as extended by Public Law 62, 83rd Congress. That section reads in part: "It is the policy of the United States to use export controls to the extent necessary (a) to protect the domestic economy from the excessive drain of scarce materials and to reduce the inflationary impact of abnormal foreign demand; (b) to further the foreign policy of the United States and to aid in fulfilling its international responsibilities; . . ."

Pro—Most spokesmen for the primary and secondary aluminum industry interpret the act to cover all phases of any given industry. They contend that the second-quarter scrap quota of 9000 tons was draining this country of a commodity that has been in short supply since the beginning of the year. Under their interpretation of the law, they feel they are entitled to protection.

Con—The State department says that such an interpretation is "far fetched;" that the law doesn't cover scrap materials. In addition, it objects to further restriction of the quotas because such action would impair this nation's efforts to get Germany back on its feet. Western Germany is handicapped in the production of aluminum because of the huge power requirements. Ninety per cent of second-quarter aluminum exports went to Germany.

The National Association of Waste Material Dealers Inc. must have had that in mind when it told Representative Sidney Yates that "important international commitments are being satisfied by making this secondary material available to those friendly foreign countries in Western Europe who are co-operating with this country's defense objectives."

Insignificant?—The association also said that the tonnage involved "represents a small part of the total available supply." Even at 9000 tons a quarter, exports would represent only 10 per cent of all aluminum scrap and only 1.5 per cent of all domestically produced aluminum. Opponents of restrictions believe this is a negligible amount and would have no bearing on the present shortage. They feel that the pinch is caused by unparalleled demand for aluminum by both civilian and military users. Scrap users say the exports are partly to blame.

At this writing there is no quota, second-quarter restrictions having expired. But new restrictions are expected momentarily. Secondary smelters are recommending a limit of 1500 tons for third quarter. Informed sources in Washington say it won't be that low, but it won't hit the second-quarter figure of 9000 tons, either.

STEEL's Metal Price Averages for June, 1955
(Cents per lb)

Electrolytic Copper, deld. Connecticut	36.000
Lead, St. Louis	14.800
Prime Western Zinc, E. St. Louis, Ill.	12.250
Straits Tin, New York	93.668
Primary Aluminum Ingots, deld.	23.200
Magnesium, Freeport, Tex.	28.500
Nickel, f.o.b. refinery	64.500

Put Damper on Coldwater Bill

Opposition is mounting against the Coldwater Bill (S.2046) which would require the government to purchase lead and zinc for stockpile at 16 cents and 15.5 cents a pound, respectively. Both industry and government officials have testified before the Senate Committee on Interior & Insular Affairs that this would tend to contract the markets for these metals rather than uphold production. The higher-than-market price would attract the metal, causing temporary shortages and encouraging substitutes. Many in the industry feel that the present procurement program, with its flexibility, is doing a satisfactory job. The present price as compared with year-ago levels and lower inventories are strong arguments in their favor. The goals for this program are only between 60 and 70 per cent complete, indicating that at the present rate, stockpile purchases will continue well into 1956.

Copper Shortage Gets Worse

Copper supply is getting farther behind the eight ball as the year progresses. Even at full production the industry couldn't supply the demand. But last week, about 60 per cent of the mines were shut down by a strike and about half of the smelting facilities were inoperative. Assuming that the quick settlement of the steel strike would serve as a guide in settlement of the copper walkout, at least a week's production was lost. The effects of the lost production were not noticeable last week. Copper men believe it would take a two-week interruption to empty supply lines. But over the long haul it will simply make a bad situation worse. The only bright spot in the picture is that many copper users scheduled their vacations for July, which means a lower consumption rate. However, some of them are still buying to build up inventories.

One thing is certain. The stoppage will increase the number of hardship cases among users of copper. Some of those consumers feel that the government gave them a raw deal when it stepped out of the copper distribution picture on May 27. They were expected to request re-establishment of the government's middleman role when they met July 7 with Assistant Commerce Secretary Lothair Teetor.

Market Memos

- Some of the 45-cent copper has been traced to a group of brokers who bought on the London market in April when the price was fluctuating between 38 and 42 cents. They are just now getting delivery, and are adding a cent-a-pound freight and somewhat more profit.

- S. S. Inch, vice president in charge of sales, Kaiser Aluminum & Chemical Sales Inc., says it's not a question of whether Kaiser will expand, "but a question of when and how much."

"Since being rammed with Permanente 165, this open hearth bottom produced 18,130 tons in a 30-day period —500 more tons than this furnace ever has produced." How? Less down-time!

This report from a leading steel mill is only one of the many proving how the superiority of Permanente 165 ramming mix results in increased production and lowered costs.

Permanente 165 is a high MgO periclase material of high refractoriness that is self-bonding by crystalline growth. Impurities are minimized because no sintering agents, no low melting fluxes are present.

Its high density and absence of shrinkage cracks and connected voids give a greater resistance to the chemical attack of iron oxide and basic open hearth slag.

Upon request, your Kaiser refractory engineer will promptly offer you research, design and installation service to help you obtain more steel tonnage, and improved quality—at lower bottom cost per ton.

Call or write *Kaiser Chemicals Division*, Kaiser Aluminum & Chemical Sales, Inc. Regional sales offices: OAKLAND 12, California, 1924 Broadway; AKRON 8, Ohio, First National Tower Bldg.; CHICAGO, 518 Calumet Bldg., 5231 Hohman Ave., Hammond, Indiana.

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Refractory Brick and Ramming Materials
Dolomite • Magnesia
Magnesite • Alumina • Periclase

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.50; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.50; No. 195, 4.5% Cu, 0.8% Si, 25.90; No. 214, 3.8% Mg, 26.40; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 23.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic 36.00 deld. Conn. Valley; 36.00 deld. Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$100 nom, per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 98% +, cups or ingot, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8%, self-palletizing pig 23.50; notched ingot 20.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingots; for Los Angeles, add 2.50 for both pig and ingot. Sticks 1.5 in. diameter, 49.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 34.00; alloy M 36.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $276-$278 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.00 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom., per troy oz.

Palladium: $22-$24 per troy oz.

Platinum: $79-$81 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $115-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 90.125 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod $68.70 per lb; powder $56.65 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N.Y., spot, 95.375; prompt, 95.125.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.2% Fe max) $3.95, grade A-2 (0.5% Fe max) $3.50 per pound.

Tungsten: Powder, 98.5%, carbon reduced, 1000-lb lots $4.35-$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 12.50; brass special, 12.75; intermediate, 13.00, E. St. Louis, freight allowed over 0.50 per pound. High grade, 13.85; special high grade, 14.00 deld. Diecasting alloy ingot No. 3, 16.50; Nos. 2 and 5, 17.00, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $7.50 per lb. Powder, electronics grade, $15 per lb; flash grade, $11.50. (Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 27.25-29.00; No. 12 foundry alloy (No. 2 grade), 26.50; 5% silicon alloy, 0.60 Cu max, 28.50-28.75; 13 alloy, 0.60 Cu max, 28.50-28.75; 195 alloy, 28.50-28.75; 108 alloy, 27.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 27.50; grade 2, 26.50; grade 3, 25.50; grade 4, 25.00.

Brass Ingot: Red brass No. 115, 34.50; tin bronze No. 225, 45.00; No. 245, 39.75; high-leaded tin bronze No. 305, 38.00; No. 1 yellow, No. 406, 29.25; manganese bronze No. 421, 31.75.

Magnesium Alloy Ingot: AZ63A, 32.00; AZ91B, 32.00; AZ91C, 32.00; AZ92A, 32.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.74; rod, bar, wire, $1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35; 30,000-lb lots, 41.45; l.c.l., 41.95. Weatherproof, 100,000-lb, 40.78; 30,000 lb, 41.05; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.15; l.c.l., 48.90.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20 per cwt; pipe, full coils $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $14.00-$14.50; sheared mill plate, $11.00; strip, $14.00-$14.50; wire, $10.00-$10.50; forging billets, $3.75; hot-rolled and forged bars, $3.75.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 20.00-20.50; plates, 19.00-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks		65	

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.5
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.5
Cold-finished				
0.375-0.547	49.9	47.5	59.5	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.3
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.037	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.3
0.029-0.024	39.7	45.5	36.3	41.8
0.023-0.019	40.4	46.9	37.1	42.6
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.6
0.010-0.0095	46.5	...	42.5	50.2
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72.240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam, 72-180 in. lengths.

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.10	3	$ 49.55
1	25.35	4	136.65
1¼	34.30	6	244.90
1½	41.00	8	368.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.00, 0.064-in. 76.00, 0.125-in. 61.50, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 80.00, 30,000 lb or more, 0.250 in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 62.00, 30,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in., 72.20; 1 x 4 in., 67.00. Rod, 1 in., 69.00; 2 in., 66.50. Tubing, 1 in. OD x 0.065 in., 99.00. Angles, 1 x 1 x ⅛-in., 75.00; 2 x 2 x ⅛-in., 70.00. Channels, 5 in., 70.90. I-beams, 5 in., 70.20.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 15.00-15.50; old sheets, 12.00-12.50; borings and turnings, 8.50-9.00; crankcases, 12.00-12.50; industrial castings, 12.00-12.50.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.76b	52.36c	....	54.82	32.000	32.000	31.250
Yellow Brass	46.27	46.21d	46.81	49.15	23.875	23.625	22.000
Red Brass, 85%	50.99	50.98	51.53	53.80	28.125	27.875	27.375
Low Brass, 80%	49.75	49.69	50.29	52.56	27.000	26.750	26.750
Naval Brass	49.99	44.30	57.05	53.15	23.125	21.875	21.375
Com. Bronze, 90%	53.73	53.72	53.32	55.34	29.250	29.000	28.500
Nickel Silver, 10%	60.20	62.58g	62.53	....	27.625	27.375	13.813
Phos. Bronze, A, 5%	73.03	73.63	72.53	74.71	32.250	32.000	31.000
Silicon Bronze	58.82	58.01	56.56	60.80e	31.125	30.875	30.125
Manganese Bronze	53.73	47.53	56.24	....	22.125	21.875	21.375
Munts Metal	48.14	43.95	....	....	22.375	22.125	21.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: No. 1 heavy copper and wire, 32.00-33.00; No. 2 heavy copper and wire, 30.50-32.00; light copper, 28.50-30.00; No. 1 composition red brass, 25.00-26.00; No. 1 composition turnings, 24.50-25.50; yellow brass turnings, 15.00; new brass clippings, 21.50-23.00; No. 1 brass rod turnings, 19.50-21.00; light brass, 15.50-17.00; heavy yellow brass, 17.00-18.00; new brass rod ends, 20.50-22.00; auto radiators, unsweated, 16.50-20.00; cocks and faucets, 20.00-20.50; brass pipe, 20.00-20.50.

Lead: Heavy, 11.50-12.00; battery plates, 6.50-6.75; linotype and stereotype, 14.00-14.25; electrotype, 12.00-12.50; mixed babbitt, 14.50.

Magnesium: Clippings 18.50-19.50; clean castings 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.

Monel: Clippings, 38.00-39.00; old sheets, 33.00-34.50; turnings, 29.50; rods, 38.00-39.00.

Nickel: Sheets and clips, 80.00-90.00; rolled anodes, 80.00-90.00; turnings, 65.00-75.00; rod ends, 80.00-90.00.

Zinc: Old zinc, 5.00-5.50; new die-cast scrap, 5.00-5.50; old die-cast scrap, 3.50-3.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 18.50-19.50; 3003 clippings, 18.00-20.00; 6151 clippings, 18.00-19.50; 5052 clippings, 18.00-19.50; 2014 clippings, 17.50-19.00; 2017 clippings, 17.50-19.00; 2024 clippings, 17.50-19.00; mixed clippings, 17.00-19.50; old sheet, 15.00-16.50; old cast, 15.50-16.50; clean old cable (free of steel), 18.00-19.50; borings and turnings, 16.50-17.50.

Beryllium Copper: Heavy scrap, 0.030-in. and heavier, not less than 1.5% Be, 48.00; light scrap 43.00.

Copper and Brass: No. 1 copper, 35.50-36.00; No. 2 copper, 34.00-34.50; light copper, 32.25-32.75; refinery brass (60% copper) per dry copper content, 30.50-31.75.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 copper, 35.25; No. 2 copper, 33.25-33.75; light copper, 31.00-32.00; No. 1 composition borings, 27.50-27.75; No. 1 composition solids, 28.00-28.25; heavy yellow brass solids, 20.00-21.00; yellow brass turnings, 19.00-20.00; radiators, 21.00-22.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 51.42, oval 50.92, 5000-10,000 lb; electrodeposited 49.40, 2000-5000 lb lots; cast 50.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb $1.015; 100-499 lb 99.50; 500-4999 lb 95.50; 5000-29,999 lb 93.50; 30,000 lb 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

Tin: Bar or slab, less than 200 lb, $1.135; 200-499 lb, $1.13; 500-999 lb, $1.115; 1000 lb or more, $1.11.

Zinc: Bar, 21.00; bar or flat top, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: 100 lb 76.50; 200 lb 76.05; 300 lb 75.80; 400-900 lb 75.05; 1000 lb and over 73.05; effective Mar. 24, 1955.

Copper Sulphate: Crystal, 100 lb 21.50; 200 lb 18.50; 300 lb 17.50; 400 lb 17.00; 500-1900 lb 15.50; 2000-10,000 lb 15.25; 10,000 lb and up 1515. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.

Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 73.00; 100-500 lb, 67.00; 700-1900 lb, 55.20; 2000-9900 lb, 53.40; 10,000 lb or more, 52.30.

Stannous Chloride (Anhydrous): Less than 50 lb, $1.563; 50 lb, $1.243; 100-300 lb, $1.092; 400-900 lb, $1.063; 1000-1900 lb, $1.043; 2000-4900 lb, $1.006; 5000-19,900 lb, 94.60; 20,000 lb or more, 88.50.

Stannous Sulphate: Less than 50 lb, $1.281; 50 lb, 98.10; 100-1900 lb, 96.1; 2000 lb or more, 94.10.

Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

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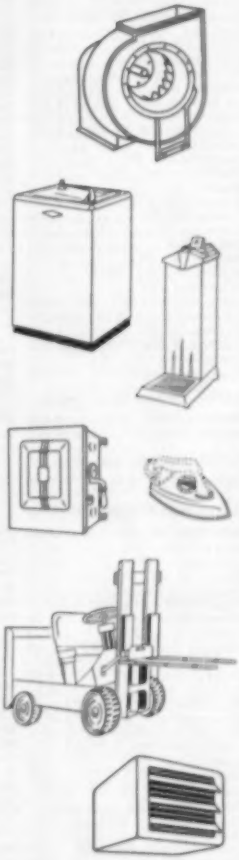

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Formings . . . Stampings . . . Weldments

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.*
Code numbers following mill points indicate producing company. Key on page 135. Key to footnotes, page 137.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ..... $61.50

INGOTS, Alloy (NT)

Detroit R7 ..... $65.00
Houston S5 ..... 70.00
Midland,Pa. C18 ..... 85.00
Munhall,Pa. U5 ..... 69.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ..... $64.00
Bessemer,Pa. U5 ..... 68.50
Bridgeport,Conn. N19 ..69.00
Buffalo R2 ..... 64.00
Clairton,Pa. U5 ..... 68.50
Easley,Ala. T2 ..... 68.50
Fairfield,Ala. T2 ..... 68.50
Fontana,Calif. K1 ....72.00
Gary,Ind. U5 ..... 68.50
Johnstown,Pa. B2 .... 64.00
Lackawanna,N.Y. B2 .. 64.00
Lonestar,Tex. L6 ..... 70.00
Munhall,Pa. U5 ..... 68.50
Pittsburgh J5 ..... 64.00
So.Chicago,Ill. R2 .... 64.00
Chicago U5 ..... 68.50
So.Duquesne,Pa. U5 .. 68.50
Youngstown R2 ..... 64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ....$78.00
Bessemer,Pa. U5 ..... 84.50
Bridgeport,Conn. N19 ..83.00
Buffalo R2 ..... 78.00
Canton,O. R2 ..... 80.00
Clairton,Pa. U5 ..... 84.50
Conshohocken,Pa. A3 ..83.00
Easley,Ala. T2 ..... 84.50
Fairfield,Ala. T2 ..... 84.50
Fontana,Calif. K1 ....86.00
Gary,Ind. U5 ..... 84.50
Geneva,Utah C11 ..... 78.00
Houston S5 ..... 83.00
Johnstown,Pa. B2 ....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 ..... 87.50
Midland,Pa. C18 ..... 78.00
Munhall,Pa. U5 ..... 84.50
Pittsburgh J5 ..... 78.00
Seattle B3 ..... 91.50
So.Chicago R2, W14 ....78.00
So.Chicago U5 ..... 84.50
So.Duquesne,Pa. U5 .. 84.50
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$86.00
Buffalo R2 ..... 86.00
Canton,O. R2, T7 .... 86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 ..... 86.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 ..... 96.00
Houston S5 ..... 91.00
Ind.Harbor,Ind. Y1 ...86.00
Johnstown,Pa. B2 .... 86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 ..... 106.00
Massillon,O. R2 ..... 86.00
Midland,Pa. C18 ..... 86.00
Munhall,Pa. U5 ..... 96.00
So.Chicago R2, W14 ..86.00
So.Chicago U5 ..... 96.00
So.Duquesne,Pa. U5 .. 96.00
Struthers,O. Y1 ..... 86.00
Warren,O. C17 ..... 86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 ..... $96.50
Canton,O. R2 ..... 96.50
Cleveland R2 ..... 96.50
Gary,Ind. U5 ..... 103.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 .. 103.50

SKELP

Aliquippa,Pa. J5 ..... 4.00
Fontana,Calif. K1 ....4.775
Lonestar,Tex. L6 ..... 4.30
Munhall,Pa. U5 ..... 4.225
SparrowsPoint,Md. B2 ..3.90
Warren,O. R2 ..... 3.90
Youngstown R2 ..... 3.90
Youngstown U5 ..... 4.225

WIRE RODS

AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 .....4.675
Alton,Ill. L1 ..... 4.85
Buffalo B11, W12 ....4.675
Cleveland A7 ..... 5.025
Donora,Pa. A7 ..... 5.025
Fairfield,Ala. T2 ..... 5.025
Fontana,Calif. K1 ....5.475
Houston S5 ..... 4.925
IndianaHarbor,Ind. Y1 .4.675
Johnstown,Pa. B2 .... 4.675
Joliet,Ill. A7 ..... 5.025
KansasCity,Mo. S6 .... 4.925
Kokomo,Ind. C16 .... 4.775
Los Angeles B3 .....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 ..... 4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ...5.325
Portsmouth P12 ..... 4.675
Roebling,N.J. R5 ..... 4.775
So.Chicago,Ill. R2 .... 4.675
SparrowsPoint,Md. B2..4.775
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 ..... 4.775
Struthers,O. Y1 ..... 4.675
Torrance,Calif. C11 ...5.475
Worcester,Mass. A7 ...5.325

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 ..... 4.25
Aliquippa,Pa. J5 ..... 4.25
Bessemer,Ala. T2 ..... 4.60
Bethlehem,Pa. B2 ..... 4.30
Birmingham C15 ..... 4.25
Clairton,Pa. U5 ..... 4.60
Fairfield,Ala. T2 ..... 4.60
Fontana,Calif. K1 .... 4.90
Gary,Ind. U5 ..... 4.60
Geneva,Utah C11 ..... 4.25
Houston S5 ..... 4.30
Ind.Harbor,Ind. I-2 .... 4.25
Johnstown,Pa. B2 .... 4.30
KansasCity,Mo. S5 .... 4.30
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 ..... 4.95
Minnequa,Colo. C10 .... 4.70
Munhall,Pa. U5 ..... 4.60
Niles,Calif. P1 ..... 4.90
Portland,Oreg. O4 .... 5.00
Phoenixville,Pa. P4 .... 4.20
Seattle B3 ..... 5.00
So. Chicago W14 ..... 4.25
So.Chicago U5 ..... 4.60
So.SanFrancisco B3 .... 4.90
Torrance,Calif. C11 .... 4.95
Weirton,W.Va. W6 .... 4.25

Wide Flange

Bethlehem,Pa. B2 ..... 4.30
Clairton,Pa. U5 ..... 4.60
Fontana,Calif. K1 .... 5.25
Lackawanna,N.Y. B2 ..4.30
Munhall,Pa. U5 ..... 4.60
Phoenixville,Pa. P4 .... 4.30
So.Chicago,Ill. U5 ..... 4.60

Alloy Std. Shapes

Clairton,Pa. U5 ..... 5.65
Fontana,Calif. K1 .... 5.60
Gary,Ind. U5 ..... 5.65
Houston S5 ..... 5.25
Munhall,Pa. U5 ..... 5.65
So.Chicago,Ill. U5 ..... 5.65

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 ..... 6.40
Bessemer,Ala. T2 ..... 6.75
Bethlehem,Pa. B2 ..... 6.45
Clairton,Pa. U5 ..... 6.75
Fairfield,Ala. T2 ..... 6.75
Fontana,Calif. K1 .... 7.05
Gary,Ind. U5 ..... 6.75
Geneva,Utah C11 ..... 6.40
Houston S5 ..... 6.45
Ind.Harbor,Ind. I-2, Y1.6.40
Johnstown,Pa. B2 ..... 6.45
KansasCity,Mo. S5 .... 6.46
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ..... 7.10
Munhall,Pa. U5 ..... 6.75
Seattle B3 ..... 7.15
So.Chicago,Ill. W14 ....6.40
So.Chicago U5 ..... 6.75
So.SanFrancisco B3 .... 7.05
Struthers,O. Y1 ..... 6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ..... 6.45
Lackawanna,N.Y. B2 ...6.46
Munhall,Pa. U5 ..... 6.75
So.Chicago,Ill. U5 ..... 6.75

PILING

BEARING PILES

Munhall,Pa. U5 ..... 4.60
So.Chicago,Ill. U5 ..... 4.60

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ...5.075
Lackawanna,N.Y. B2..5.075
Munhall,Pa. U5 ..... 5.45
So.Chicago,Ill. U5 ..... 5.45

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 ..... 4.225
Aliquippa,Pa. J5 ..... 4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 ..... 4.50
Bridgeport,Conn. N19 ..4.475
Buffalo R2 ..... 4.225
Clairton,Pa. U5 ..... 4.50
Claymont,Del. C22 .... 4.225
Cleveland J5, R2 ..... 4.225
Coatesville,Pa. L7 .... 4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 ..... 4.325
Fairfield,Ala. T2 ..... 4.50
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 ..... 4.50
Geneva,Utah C11 ..... 4.225
GraniteCity,Ill. G4 .... 4.425
Harrisburg,Pa. C5 .... 4.225
Houston S5 ..... 4.275
Ind.Harbor,Ind. I-2,Y1.4.225
Johnstown,Pa. B2 .... 4.225
Lackawanna,N.Y. B2 ..4.225
Lonestar,Tex. L6 ..... 4.55
Mansfield,O. E6 ..... 4.225
Minnequa,Colo. C10 ...5.075
Munhall,Pa. U5 ..... 4.50
Newport,Ky. N9 ..... 4.225
Pittsburgh J5 ..... 4.225
Riverdale,Ill. A1 ..... 4.225
Seattle B3 ..... 5.125
Sharon,Pa. S3 ..... 4.225
So.Chicago R2, W14 ..4.225
So.Chicago U5 ..... 4.50
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ...4.225
Warren,O. R2 ..... 4.225
Weirton,W.Va. W6 .... 4.225
Youngstown R2, Y1 ..4.225
Youngstown U5 ..... 4.50

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 ....6.025
Geneva,Utah C11 ..... 5.375

PLATES, Wrought Iron

Economy,Pa. B14 ..... 9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.45
Bessemer,Ala. T2 ..... 6.725
Clairton,Pa. U5 ..... 6.725
Cleveland J5, R2 ..... 6.45
Coatesville,Pa. L7 .... 6.45
Conshohocken,Pa. A3 ..6.45
Ecorse,Mich. G5 ..... 6.55
Fairfield,Ala. T2 ..... 6.725
Fontana,Calif.(30) K1 ..7.15
Gary,Ind. U5 ..... 6.725
Geneva,Utah C11 ..... 6.45
Houston S5 ..... 6.50
Ind.Harbor,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 ..... 6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ..... 7.35
Munhall,Pa. U5 ..... 6.725
Pittsburgh J5 ..... 6.45
Seattle B3 ..... 7.35
Sharon,Pa. S3 ..... 6.45
So.Chicago,Ill. W14 ....6.45
So.Chicago U5 ..... 6.725
SparrowsPoint,Md. B2 ..6.45
Youngstown Y1 ..... 6.45
Youngstown U5 ..... 6.725

PLATES, Alloy

Claymont,Del. C22 ....5.80
Coatesville,Pa. L7 ..... 5.80
Fontana,Calif. K1 ..... 6.45
Gary,Ind. U5 ..... 6.30
Houston S5 ..... 5.85
Ind.Harbor,Ind. Y1 ....5.80
Johnstown,Pa. B2 ..... 5.80
Munhall,Pa. U5 ..... 6.30
Newport,Ky. N9 ..... 5.80
Seattle B3 ..... 6.70
Sharon,Pa. S3 ..... 5.80
So.Chicago,Ill. W14 ....5.80
So.Chicago U5 ..... 6.30
SparrowsPoint,Md. B2 ..5.80
Youngstown Y1 ..... 5.80

FLOOR PLATES

Cleveland J5 ..... 5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 .... 5.275
Ind.Harbor,Ind. I-2 .... 5.275
Munhall,Pa. U5 ..... 5.575
So.Chicago,Ill. U5 ..... 5.575

PLATES, Ingot Iron

Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 ..... 4.825
Warren,O. c.l. R2 .... 4.825

BARS

BAR, Hot-Rolled Carbon

Ala.City,Ala. R2 ..... 4.30
Aliquippa,Pa. J5 ..... 4.30
Alton,Ill. L1 ..... 4.50
Atlanta A11 ..... 4.50
Bessemer,Ala. T2 ..... 4.65
Birmingham C15 ..... 4.30
Bridgeport,Conn. N19 ..4.55
Buffalo R2 ..... 4.30
Canton,O. R2 ..... 4.40
Clairton,Pa. U5 ..... 4.65
Cleveland R2 ..... 4.30
Ecorse,Mich. G5 ..... 4.40
Emeryville,Calif. J7 .... 5.05
Fairfield,Ala. T2 ..... 4.65
FairlessHills,Pa. U5 .. 4.80
Fontana,Calif. K1 ..... 5.00
Gary,Ind. U5 ..... 4.65
Houston S5 ..... 4.55
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 ..... 4.30
Joliet,Ill. P22 ..... 4.30
KansasCity,Mo. S5 .... 4.55
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 4.40
Midland,Pa. C18 ..... 4.30
Milton,Pa. M18 ..... 4.30
Minnequa,Colo. C10 ....4.70
Niles,Calif. P1 ..... 5.00
N.Tonawanda,N.Y. B11..4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 .... 5.05
Seattle B3, N14, P23 ....5.05
So.Chicago R2, W14 ....4.30
So.Chicago U5 ..... 4.65
So.Duquesne,Pa. U5 .. 4.65
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 ..... 4.40
Struthers,O. Y1 ..... 4.30
Torrance,Calif. C11 .... 5.00
Warren,O. R2 ..... 4.30
Weirton,W.Va. W6 .... 4.30
Youngstown R2 ..... 4.30
Youngstown U5 ..... 4.65

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ....5.075
Bridgeport,Conn. N19 ..5.225
Buffalo R2 ..... 5.075
Canton,O. R2, T7 .... 5.075
Clairton,Pa. U5 ..... 5.575
Detroit R7 ..... 5.075
Ecorse,Mich. G5 ..... 5.175
Fontana,Calif. K1 .... 6.125
FairlessHills,Pa. U5 .. 5.725
Gary,Ind. U5 ..... 5.575
Houston S5 ..... 5.325
Ind.Harbor,Ind. I-2, Y1.5.075
Johnstown,Pa. B2 .... 5.075
KansasCity,Mo. S5 .... 5.325
Lackawanna,N.Y. B2..5.075
LosAngeles B3 ..... 6.125
Massillon,O. R2 ..... 5.075
Midland,Pa. C18 ..... 5.075
So.Chicago R2, W14 ..5.075
So.Chicago U5 ..... 5.575
So.Duquesne,Pa. U5 ...5.075
Struthers,O. Y1 ..... 5.075
Warren,O. C17 ..... 5.075
Youngstown U5 ..... 5.575

BARS, H.R. Loaded Alloy

Warren,O. C17 ..... 5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.45
Bessemer,Ala. T2 ..... 6.80
Bethlehem,Pa. B2 ..... 6.45
Clairton,Pa. U5 ..... 6.80
Cleveland R2 ..... 6.45
Ecorse,Mich. G5 ..... 6.55
Fairfield,Ala. T2 ..... 6.80
Fontana,Calif. K1 ..... 7.70
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.70
Ind.Harb.,Ind. I-2, Y1..6.45
Johnstown,Pa. B2 .... 6.45
KansasCity,Mo. S5 .... 6.70
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ..... 7.15
Pittsburgh J5 ..... 6.45
Seattle B3 ..... 7.20
So. Chicago W14 ..... 6.45
So.Duquesne,Pa. U5 .. 6.80
So.SanFrancisco B3 .... 7.20
Struthers,O. Y1 ..... 6.45
Warren,O. R2 ..... 6.45
Youngstown U5 ..... 6.80

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 ..... 6.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 ..... 4.30
Atlanta A11 ..... 4.50
Fontana,Calif. K1 ..... 5.00
Niles,Calif. P1 ..... 5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 .... 5.05
SanFrancisco S7 ..... 4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 ..... 5.65
Gary,Ind. U5 ..... 5.65
Houston S5 ..... 5.45
KansasCity,Mo. S5 .... 5.45
Youngstown U5 ..... 5.65

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ..... 5.40
BeaverFalls,Pa. M12,R2..5.40
Buffalo B5 ..... 5.45
Camden,N.J. P13 ..... 5.85
Carnegie,Pa. C12 ..... 5.40
Chicago W18 ..... 5.40
Cleveland A7, C20 .... 5.40
Detroit R7 ..... 5.40
Detroit B5, P17 ..... 5.80
Donora,Pa. A7 ..... 5.90
Elyria,O. W8 ..... 5.40
FranklinPark,Ill. N5 ....5.40
Gary,Ind. R2 ..... 5.40
GreenBay,Wis. P7 ..... 5.40
Hammond,Ind. L2, M13..5.40
Hartford,Conn. R2 .... 5.90
Harvey,Ill. B5 ..... 5.40
LosAngeles R2, S30 .... 6.85
Massillon,O. R2 R8 .... 5.40
Midland,Pa. C18 ..... 5.40
Monaca,Pa. S17 ..... 5.40
Newark,N.J. W18 ..... 5.85
NewCastle,Pa. (17) B4 ..5.40
Pittsburgh J5 ..... 5.40
Plymouth,Mich. P5 .... 5.85
Putnam,Conn. W18 .... 5.95
Readville,Mass. C14 .... 5.95
So.Chicago,Ill. W14 .... 5.40
SpringCity,Pa. K3 .... 5.85
Struthers,O. Y1 ..... 5.40
Waukegan,Ill. A7 ..... 5.90
Worcester,Mass. W19 ....5.85
Youngstown F3, Y1 .... 5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19..4.65

BARS, Cold-Finished Alloy

AmbridgePa. W18 ..... 6.425
BeaverFalls,Pa. M12,R2 6.425
Bethlehem,Pa. B2 .... 6.625
Buffalo B5 ..... 6.625
Camden,N.J. P13 ..... 6.80
Canton,O. T7 ..... 6.625
Carnegie,Pa. C12 ..... 6.625
Chicago W18 ..... 6.625
Cleveland A7, C20 .... 6.625
Detroit R7 ..... 6.625
Detroit B5, P17 ..... 6.825
Donora,Pa. A7 ..... 6.625
Elyria,O. W8 ..... 6.625
Gary,Ind. R2 ..... 6.625
GreenBay,Wis. P7 .... 6.625
Hammond,Ind. L2,M13..6.625
Hartford,Conn. R2 .... 6.925
Harvey,Ill. B5 ..... 6.625
Lackawanna,N.Y. B2 ..6.625
LosAngeles S30 ..... 8.30
Mansfield,Mass. B5 .... 6.925
Massillon,O. R2, R8 ..6.625
Midland,Pa. C18 ..... 6.625
Monaca,Pa. S17 ..... 6.625
Newark,N.J. W18 ..... 6.80
Plymouth,Mich. P5 .... 6.625
So.Chicago W14 ..... 6.625
SpringCity,Pa. K3 .... 6.80
Struthers,O. Y1 ..... 6.625
Warren,O. C17 ..... 6.625
Waukegan,Ill. A7 .... 6.625
Worcester,Mass. A7 .... 6.925
Youngstown F3, Y1 .... 6.625

BARS, C.F. Loaded Alloy

Ambridge,Pa. W18 ....7.525
Camden,N.J. P13 ..... 7.70
Carnegie,Pa. C12 ....7.525
Chicago W18 ..... 7.525
Cleveland C20 ..... 7.525
Monaca,Pa. S17 ..... 7.525
Newark,N.J. W18 ....7.70
SpringCity,Pa. K3 ....7.70
Warren,O. C17 ..... 7.525

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 ..... 4.30
Atlanta A11 ..... 4.50
Birmingham C15 ..... 4.30
Buffalo R2 ..... 4.30
Cleveland R2 ..... 4.30
Emeryville,Calif. J7 .... 5.05
Fairfield,Ala. T2 ..... 4.65
FairlessHills,Pa. U5 .. 4.80
Fontana,Calif. K1 ..... 5.00
Ft.Worth,Tex.(42) T4 ..4.90
Gary,Ind. U5 ..... 4.65
Houston S5 ..... 4.55

Ind.Harbor,Ind. I-2, Y1..4.30
Johnstown,Pa. B2 .....4.30
Joliet,Ill. P22 .....4.30
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....5.00
Pittsburg,Calif. C11 ...5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SandSprings,Okla. S5 ...4.80
Seattle B3, N14, P23 ...5.05
So.Chicago R2 .....4.30
So.Duquesne,Pa. U5 ....4.65
So.SanFrancisco B3 ....5.05
SparrowsPoint,Md. B2 ..4.30
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Youngstown R2, Y1 ....4.30
Youngstown U5 .....4.65

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2..5.70
KansasCity,Kans. S5 ...6.50
LosAngeles B3 .....5.95
Marion,O. P11 .....5.55
Pittsburgh J5, U5 .....5.72
Seattle B3, N14, P23 ..6.15
So.SanFrancisco B3 ....6.00
SparrowsPt. ¼-1" B2 ..5.70
Williamsport,Pa. S19 ..5.60

RAIL STEEL BARS

Avis,Pa. (3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.20
ChicagoHts.(4) C2, I-2..4.30
Ft.Worth,Tex.(26) T4 ..4.75
Franklin,Pa.(3) F5 ....4.20
Franklin,Pa.(4) F5 ....4.30
Marion,O.(3) P11 .....4.20
Moline,Ill.(3) R2 .....4.30
Tonawanda(3) B12 .....4.15
Tonawanda(4) B12 .....4.30
Williamsport,Pa.(3) S19.4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks(S.R.) L5 ....10.85
McK.Rks.(D.R.)L5.... 14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel (16 Gage and Heavier)

Ala.City,Ala. R2 .....4.05
Allenport,Pa. P7 .....4.05
Ashland,Ky.(8) A10 ....4.05
Cleveland J5, R2 .....4.05
Conshohocken,Pa. A3 ...4.10
Detroit(8) M1 .....4.15
Dravosburg,Pa. U5 ....4.325
Ecorse,Mich. G5 .....4.15
Fairfield,Ala. T2 .....4.325
FairlessHills,Pa. U5 ....4.375
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.325
Geneva,Utah C11 .....4.15
GraniteCity,Ill. G4 ....4.25
Ind.Harbor,Ind. I-2, Y1.4.05
Kokomo,Ind. C16 .....4.15
Lackawanna,N.Y. B2 ...4.05
Mansfield,O. E6 (37) ...4.05
Mansfield,O. E6 (38) ...4.80
Munhall,Pa. U5 .....4.325
Newport,Ky N9 .....4.05
Niles,O. N12 .....4.05
Pittsburg,Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth,O. P12 ....4.05
Riverdale,Ill. A1 .....4.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
SparrowsPoint,Md. B2 ..4.05
Steubenville,O. W10 ....4.05
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown Y1 .....4.05
Youngstown U5 .....4.325

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.35
Kokomo,Ind. C16 .....5.20
Niles,O. N12 .....4.95

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....6.70
Youngstown Y1 .....6.70

SHEETS, H.R. (14 Ga.&Heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken,Pa. A3 ...6.15
Dravosburg,Pa. U5 ....6.375
Ecorse,Mich. G5 .....6.30
Fairfield,Ala. T2 .....6.375
FairlessHills,Pa. U5 ....6.425
Fontana,Calif. K1 ....6.875
Gary,Ind. U5 .....6.375
Ind.Harbor,Ind. I-2, Y1.6.10
Lackawanna(35) B2 ....6.10
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.10
Sharon,Pa. S3 .....6.10
So.Chicago,Ill. U5 ....6.375
SparrowsPoint(36) B2 ..6.10
Warren,O. R2 .....6.10
Weirton,W.Va. W6 ....6.10
Youngstown Y1 .....6.10
Youngstown U5 .....6.375

SHEETS, Hot-Rolled Ingot Iron (16 Gage and Heavier)

Ashland,Ky.(8) A10 ....4.30
Cleveland R2 .....4.65
Ind.Harbor,Ind. I-2 ....4.30
Warren,O. R2 .....4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Conshohocken,Pa. A3 ..5.00
Dravosburg,Pa. U5 .....5.325
Ecorse,Mich. G5 .....5.05
Fairfield,Ala. T2 .....5.325
FairlessHills,Pa. U5 ....5.375
Follansbee,W.Va. F4 ...4.95
Fontana,Calif. K1 .....6.05
Gary,Ind. U5 .....5.325
GraniteCity,Ill. G4 ....5.15
Ind.Harbor,Ind. I-2, Y1.4.95
Lackawanna,N.Y. B2 ...4.95
Middletown,O. A10 ....4.95
Newport,Ky. N9 .....4.95
Pittsburg,Calif. C11 ....5.90
Pittsburgh J5 .....4.95
Portsmouth,O. P12 ....4.95
SparrowsPoint,Md. B2 ..4.95
Steubenville,O. W10 ....4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Dravosburg,Pa. U5 ....7.875
Ecorse,Mich. G5 .....7.60
FairlessHills,Pa. U5 ....7.925
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.875
IndianaHarbor,Ind. Y1..7.50
Lackawanna(37) B2 ....7.50
Pittsburgh J5 .....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 .....7.50
Weirton,W.Va. W6 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 ....5.45

SHEETS, Culvert (16 Gage)	Cu	Cu Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.50	7.10
Dravosburg U5	5.70	....
Fairfield T2	5.70	....
Gary,Ind. U5	5.70	5.95
Ind.Harbor I-2	5.70	5.95
Kokomo,Ind. C16	5.80	....
MartinsFry. W10	5.70	....
Newport,Ky. N9	5.70	5.95
Pitts.,Calif. C11	6.45	....
SparrowsPt. B2	5.70	....

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....6.75
Gary,Ind. U5 .....5.95
MartinsFerry,O. W10 ...5.95

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....5.45‡
Ashland,Ky. A10 .....5.45*
Butler,Pa. A10 .....5.45†
Canton,O. R2 .....5.45‡
Delphos,O. N16 .....6.10‡
Dover,O. R1 .....5.45‡
Dravosburg,Pa. U5 .....5.85†
Fairfield,Ala. T2 .....5.85†
Gary,Ind. U5 .....5.85°
GraniteCity,Ill. G4 ....5.65‡
Ind.Harbor,Ind. I-2 ...5.45†
Kokomo,Ind. C16 .....5.55‡
MartinsFerry,O. W10 ..5.45°
Middletown,O. A10 ....5.45†
Newport,Ky. N9 .....5.45‡
Niles,O. N12 .....5.45‡
Pittsburg,Calif. C11 ...6.20°
SparrowsPt.,Md. B2 ...5.45‡
Steubenville,O. W10 ..5.45‡
Warren,O. R2 .....5.45†
Weirton,W.Va. W6 ....5.45°

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.325

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 .....8.60
SparrowsPoint(30) B2 ..8.20

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.85
Dravosburg,Pa. U5 ....5.85
Kokomo,Ind. C16 .....6.20
Newport,Ky. N9 .....5.85
Niles,O. N12 .....5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ....5.70

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 .....5.70
Butler,Pa. A10 .....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.30
Niles,O.(28) R2 .....6.30
Weirton,W.Va. W6 ....6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8)A10 ....5.375
Cleveland R2 .....5.375
Dravosburg,Pa. U5 .....5.90
Gary,Ind. U5 .....5.90
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ...5.375
Middletown,O. A10 ....5.375
Niles,O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 .....6.60
Yorkville,O. W10 .....7.375

SHEETS, Long Terne Steel (Commercial Quality)

Beechbottom,W.Va. W10 5.85
Gary,Ind. U5 .....6.25
Mansfield,O. E6 .....5.85
Middletown,O. A10 ....5.85
Niles,O. N12 .....5.85
Weirton,W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Frets-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Follak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts.Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod.Steel Strip Corp.
P22 Phoenix Mfg. Co.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W16 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...4.05
ABenport,Pa. P7 ....4.05
Alton,Ill. L1 .....4.225
Ashland,Ky.(8) A10 ....4.05
Atlanta A11 .....4.25
Bessemer,Ala. T2 .....4.325
Birmingham C15 .....4.05
Bridgeport,Conn. N19 ..4.20
Buffalo(27) R2 .....4.05
Conshohocken,Pa. A3 ...4.10
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.15
Fairfield,Ala. T2 .....4.325
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.325
Ind.Harbor,Ind. I-2, Y1.4.05
Johnstown,Pa.(25) B2 ..4.05
Lackaw'na,N.Y.(25) B2.4.05
LosAngeles(25) B3 ....4.80
Milton,Pa. M18 .....4.05
Minnequa,Colo. C10 ....5.15
N.Tonawanda,N.Y. B11..4.05
Pittsburg,Calif. C11 ....4.80
Portsmouth,O. P12 ....4.05
Riverdale,Ill. A1 .....4.05
SanFrancisco 87 .....5.00
Seattle(25) B3, P23 ....5.05
Seattle N14 .....5.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ...4.05
So.SanFrancisco(25) B3.4.80
SparrowsPoint,Md. B2..4.05
Sterling(1) N15 .....4.05
Sterling,Ill. N15 .....4.15
Torrance,Calif. C11 ....4.80
Warren,O. R3 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5 .....4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19 ..7.00
Carnegie,Pa. S18 .....6.70
Fontana,Calif. K1 .....8.10
Gary,Ind. U5 .....7.20
Ind.Harbor,Ind. Y1 ....6.70
LosAngeles B3 .....7.90
Newport,Ky. N9 .....6.70
Seattle P23 .....7.80
Sharon,Pa. S3 .....6.70
So.Chicago W14 .....6.70
Youngstown Y1 .....6.70
Youngstown U5 .....7.20

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....6.425
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.25
Fairfield,Ala. T2 .....6.425
Fontana,Calif. K1 .....7.25
Gary,Ind. U5 .....6.425
Houston S5 .....6.40
Ind.Harbor,Ind. I-2, Y1.6.15
KansasCity,Mo. S5 ....6.40
Lackawanna,N.Y. B2 ..6.15
LosAngeles(25) B3 ....6.90
Seattle(25) B3, P23 ....7.15
Sharon,Pa. S3 .....6.15
So.SanFrancisco(25) B3.6.90
SparrowsPoint,Md. B2..6.15
Warren,O. R3 .....6.15
Weirton,W.Va. W6 ....6.15
Youngstown U5, Y1 ....6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....4.30
Warren,O. R3 .....4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.75
Baltimore T6 .....5.75
Boston T6 .....6.30
Cleveland A7 .....5.75
Cleveland A7 .....6.45
Conshohocken,Pa. A3 ...5.80
Dearborn,Mich. D3 ....5.85
Detroit D2, M1, P20 ....5.85
Dover,O. G6 .....5.75
Ecorse,Mich. G5 .....5.85
Follansbee,W.Va. F4 ...5.75
Fontana,Calif. K1 .....7.50
FranklinPark,Ill. T6 ...5.85
Ind.Harbor,Ind. I-2 ....5.85
Ind.Harbor,Ind. Y1 ....5.75
Indianapolis C8 .....5.90
LosAngeles C1 .....7.50
Middletown,O. A10 .....5.75
NewBedford,Mass. R10..6.20
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5 ...5.75
NewHaven,Conn. A7 ...7.20
NewHaven,Conn. D2 ....6.20
NewKensington,Pa. A6..5.75
Pawtucket,R.I. R3 ....6.40
Pawtucket,R.I. N8 ....6.30
Pittsburgh J5 .....5.75
Portsmouth,O. P12 ....5.75
Riverdale,Ill. A1 .....5.85
Rome,N.Y.(32) R8 ....5.75
Sharon,Pa. S3 .....5.75
SparrowsPt.,Md. B2 ....5.75
Trenton,N.J.(31) R5 ...7.30
Wallingford,Conn. W2 ..6.20
Warren,O. B9, R2, T5...5.75
Weirton,W.Va. W6 ....5.75
Worcester,Mass. A7 ....7.30
Youngstown C8, Y1 ....5.75

STRIP, Cold-Rolled Alloy

Boston T6 .....12.80
Carnegie,Pa. S18 .....12.45
Cleveland A7 .....12.45
Dover,O. G6 .....12.45
Fontana,Calif. K1 .....14.85
FranklinPark,Ill. T6 ..12.45
Harrison,N.J. C18 ....12.45
Pawtucket,R.I. N8 ....12.80
Sharon,Pa. S3 .....12.45
Worcester,Mass. A7 ...12.75
Youngstown C8 .....12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5 .....8.60
Dearborn,Mich. D3 ....8.70
Dover,O. G6 .....8.60
Ecorse,Mich. G5 .....8.70
Ind.Harbor,Ind. Y1 ....8.60

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Boston T6	6.30	8.35	9.30	11.45	14.15
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	....	....
Detroit D2	5.85	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.30	9.00	11.15	13.85
NewBritain,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewKensington,Pa. A6	5.75	8.00	9.00	11.15	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R8	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.00	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.00	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6..	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
FranklinPark,Ill. T6	...	...	13.40	16.10	19.30
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6..	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.25

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	...	9.10	10.00	11.00
Brackenridge,Pa. A4	....	...	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.80	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.80	9.10	10.10	11.00
Niles,O. N12	8.025	8.80	9.10	10.10	....
Vandergrift,Pa. U5	....	8.80	9.10	10.10	11.00
Warren,O. R3	8.025	8.80	9.10	10.10	11.00
Zanesville,O. A10	....	8.80	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	9.65	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.50*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.325†	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

*Semiprocessed. †Fully processed only. ‡Coils annealed, semiprocessed ½c lower. §Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TINPLATE,American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Dravosburg,Pa. U5	6.60
Fairfield,Ala. T2	6.70
FairlessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.20
Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$7.85
Gary,Ind. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$5.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland C20	5.75
Cleveland A7	*6.25*
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	*6.25*
Duluth,Minn. A7	*6.25*
Fairfield,Ala. T2	*6.25*
Fostoria,O.(24) S1	5.95
Houston S5	6.00
Jacksonville,Fla. M8	6.27
Johnstown,Pa. B2	5.75
Joliet,Ill. A7	*6.25*
KansasCity,Mo. S5	6.00
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No. Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	*6.25*
So.Chicago,Ill. R3	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	*6.25*
Worcester,Mass. A7	*6.55*

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.30
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	*7.90*
Donora,Pa. A7	*7.90*
Duluth,Minn. A7	*7.90*
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
Kokomo,Ind. C16	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.60
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R3	7.20
So.SanFrancisco C10	8.15
SparrowsPt.,Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	*8.20*
Waukegan,Ill. A7	*7.90*
Worcester,Mass. W12	7.50
Worcester A7	*8.20*

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	*7.60*
Donora,Pa. A7	*7.60*
Duluth,Minn. A7	*7.60*
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	*7.90*
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R3	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Struthers,O. Y1	6.90
Trenton,N.J. A7	*7.90*
Waukegan,Ill. A7	*7.60*
Worcester,Mass. A7	*7.90*

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	11.275
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.20
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.85
Waukegan,Ill. A7	11.20
Worcester,Mass. A7, T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. P12	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)

Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester,Mass. T6	9.85
Worcester,Mass. J4	10.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.00
Dover,O. G6	7.95
Fostoria,O. S1	7.95
FranklinPark,Ill. T6	8.05
Kokomo,Ind. C16	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

NAILS, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	*152*
Duluth,Minn. A7	*152*
Fairfield,Ala. T2	*152*
Galveston,Tex. D7	145
Houston,Tex. S5	142
Johnstown,Pa. B2	137
Joliet,Ill. A7	*152*
KansasCity,Mo. S5	142
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Ranbin,Pa. A7	*152*
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	*158*

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	139
Crawfordsville,Ind. M8	139
Donora,Pa. A7	*152*
Duluth,Minn. A7	*152*
Fairfield,Ala. T2	*152*
Johnstown,Pa. B2	138
Joliet,Ill. A7	*152*
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	157
Ranbin,Pa. A7	*152*
SparrowsPt.,Md. B2	140
Sterling,Ill.(1) N15	138
Worcester,Mass. A7	*158*

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$8.77
Buffalo W12	8.77
Donora,Pa. A7	8.77
Duluth,Minn. A7	8.77
Joliet,Ill. A7	8.77
Minnequa,Colo. C10	9.02
So.Chicago,Ill. R2	8.77

Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$9.05
Buffalo W12	9.05
Donora,Pa. A7	9.05
Duluth,Minn. A7	9.05
Joliet,Ill. A7	9.05
Minnequa,Colo. C10	9.30
So.Chicago,Ill. R2	9.05

Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.10
Buffalo W12	9.10
Donora,Pa. A7	9.10
Duluth,Minn. A7	9.10
Joliet,Ill. A7	9.10
Minnequa,Colo. C10	9.35
So.Chicago,Ill. R2	9.10

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	*173*
Duluth,Minn. A7	*173*
Fairfield,Ala. T2	*173*
Joliet,Ill. A7	*173*
Houston S5	160
KansasCity,Mo. S5	160
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburgh,Calif. C11	179
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	159**
Aliquippa J5	156§
Atlanta A11	164
Bartonville,Ill. K4	165
Crawfordsville,Ind. M8	164
Donora,Pa. A7	*175†*
Duluth,Minn. A7	*175†*
Fairfield,Ala. T2	*175†*
Houston,Tex. S5	164†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	*175†*
KansasCity,Mo. S5	164†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	164**
Monessen,Pa. P7	162
Pittsburg,Calif. C11	179†
Ranbin,Pa. A7	*175†*
So.Chicago,Ill. R2	159**
So.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	163

WOVEN Fence, 9-13 Ga.

	Col.
Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149§
Atlanta A11	151
Bartonville,Ill. K4	152
Crawfordsville,Ind. M8	151
Donora,Pa. A7	*162†*
Duluth,Minn. A7	*162†*
Fairfield,Ala. T2	*162†*
Houston,Tex. S5	151†
Johnstown,Pa.(43) B2	149
Joliet,Ill. A7	*162†*
KansasCity,Mo. S5	151†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	151**
Monessen,Pa. 9 ga. P17	149
Pittsburg,Calif. C11	169†
Ranbin,Pa. A7	*162†*
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	150

WIRE (16 Gage)	An'ld Stucco	Galv. Stucco
Ala.City R2	13.15	14.70**
Bartonville K4	13.25	15.15
Buffalo W12	13.15	
Cleveland A7	13.15	
Crawf'dsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer,Mass.W12	13.15	14.70†
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.05
Waukegan A7	13.15	14.70†
Worcester A7	13.45	

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	6.90	7.30**
Aliquippa J5	6.90	7.42§§
Atlanta A11	7.00	7.55
Bartonville(48) K4	7.00	7.575
Buffalo W12	6.90	7.30†
Cleveland A7	*7.40*	
Crawfordsville M8	7.00	7.55
Donora,Pa. A7	*7.40*	*7.80†*
Duluth,Minn. A7	*7.40*	*7.80†*
Fairfield T2	*7.40*	*7.80†*
Houston,Tex. S5	7.15	7.55†
Jacks'ville,Fla. M8	7.425	7.95
Johnstown B2(48)	6.90	7.45*
Joliet,Ill. A7	*7.40*	*7.80†*
KansasCity,Mo. S5	7.15	7.50†
Kokomo C16	7.00	7.40†
LosAngeles R3	7.85	
Minnequa C10	7.15	7.50**
Monessen P7 (45)	6.90	7.45
Palmer,Mass. W12	7.20	7.60†
Pitts.,Calif. C11	7.85	8.25†
Portsmouth,O. P12	6.90	
Ranbin A7	*7.40*	*7.80†*
So.Chicago R2	6.90	7.30**
So.S.Fran. C10	7.85	8.25**
SparrowsPt.B2(46)	7.00	7.55*
Sterling(1)(48)N15	6.90	7.475
Struthers,O.(48)Y1	6.90	7.40†
Worcester,Mass. A7	*7.70*	

*Based on 11c zinc; †5c zinc; §10c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅝-in. and ¾-in.	+4
⅞-in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoe	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
⅝" and smaller	55
⅝" to 1⅛", inclusive	58
1⅛" to 1⅛", inclusive	60
1⅛" and larger	65
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
⅝" or smaller	38
⅝" to 1⅛", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
⅛ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)	
Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
¾-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
¾-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25

⅞-in. under..List less 27%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2¼	12	34.63	41.52	33.50
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

RAILS	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	*4.25*			*5.65*
Easley,Ala. T2	*4.25*			*5.65*
Fairfield,Ala. T2				*5.65*
Gary,Ind. U5	*4.25*			
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	
Johnstown,Pa. B2				(16)5.35
Lackawanna,N.Y. B2	4.45	4.35		5.35
Minnequa,Colo. C10	4.45	4.35		5.85
Steelton,Pa. B2	4.45	4.35		5.35
Williamsport,Pa. S19				5.35

TIE PLATES

Fairfield,Ala. T2	*5.625*
Gary,Ind. U5	*5.625*
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh C7, P14	11.50
Seattle B3	12.00

AXLES

Ind.Harbor,Ind. S13	*7.25*
Johnstown,Pa. B2	*7.25*

JOINT BARS

Bessemer,Pa. U5	*5.825*
Fairfield,Ala. T2	*5.825*
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	*5.825*
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	*7.90*
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B2	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.i.f. N. Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ¼ in. x 1.3 in.	21.00
Annealed, 99.5% Fe.	34.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	32.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frght. allowed	
Carlots	32.20
Ton lots	34.20
Antimony, 500 lb lots	22.00*
Brass, 5000-lb lots	33.00-43.00†
Bronze, 5000-lb lots	54.25-57.25†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	49.75-57.25
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	81.25
Tin	14.50*
Zinc, 5000-lb lots	17.75-31.50†
Tungsten	Dollars
Melting grade, 99.9%	
60 to 200 mesh	4.30-4.40
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition, ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Dold San Francisco Bay area.
(23) 20 Ga. ¾" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, +50 0.40c for alloy and 0.25c H.S.-L.A.
(31) Widths over ⅝-in.; 0.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.025" and heavier, 0.35c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deduct to mill lengths or widths switching limits, 5.15c.
(47) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		38.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.66		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless Hills, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	19.75	+6.5	13.75	+2.5	16.25	1	18.75	3.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	16	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless Hills, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.00c; East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50
304L	....	....	....	36.75	41.75	40.00	43.00	46.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	34.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	35.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	29.75	38.00	48.25	56.25	55.00	57.25	60.50	64.50	64.50
316L	....	....	53.25	61.25	60.00	62.25	65.50	69.50	69.50
317	25.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
330	....	....	66.50	....	....	77.00	78.25	86.25	86.25
18-8CbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	27.00	30.75	....	33.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25
414	....	....	24.50	....	....	29.25	30.50	35.25	35.25
416	....	....	24.50	28.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	....	....	....
431	15.00	19.25	25.00	28.75	28.00	29.75	31.00	35.75	35.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	28.00
304	28.30	33.60	29.75
304-L	30.30	35.50	....
310	41.30	47.00	....
316	33.40	38.90	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	30.00	36.30	34.25
347	32.20	38.60	44.25
405	23.90	31.10	....
410	23.40	30.60	....
430	23.40	30.60	24.25
Inconel	47.90	62.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	56.50	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled 10%	Strip, Carbon Base, Cold Rolled Both Sides
Copper*	26.60	33.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7. New Castle, Ind. I-4 and Washington, Pa. J3; nickel, Inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S15.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	...		4.050
18.25	4.25	1	4.75	...		2.345-2.415
18	4	2	9	...		2.615
18	4	2	....	...		1.705
18	4	1	....	...		1.540
14	4	2	5	...		2.185
13.75	3.75	2	5	...		2.155
13.5	4	3	....	...		1.805
9	3.5	...	....	...		1.115
6	4	2	....	5		1.045
6	4	3	....	6		1.200
1.5	4	1	....	8.5		0.900

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L2, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden,Ala. R3	52.38	52.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R3	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	57.50
No. Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.85	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-2	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron,O., deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Chester,Pa. C31	....	53.50	54.00	....
Philadelphia, deld.	....	55.16	55.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.84	57.84	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	53.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos, 0.20 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50 Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls,N.Y. P15	$80.50
Keokuk,Iowa (Open-hearth & Fdry, freight allowed K2)	85.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	$61.00
Lyles,Tenn. T3	70.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Buffalo, 25 cents; Birmingham and St. Paul, 13 cents; Philadelphia, New York, Boston, San Francisco and Los Angeles, 10 cents; Atlanta, Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Galv. 10 Ga.†	Stainless Type 302	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.†	H.R. Alloy 4140†‡		Carbon	Floor
Atlanta	6.79	7.75	8.37	43.43	7.05	...	6.92	8.69	....	7.08	7.09	8.83
Baltimore	6.62	7.51	7.79	....	6.62	...	6.62	8.62	12.54	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25§	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.57	45.28*	7.47	...	7.20	8.60	12.60	7.49	7.37	8.50
Buffalo	6.30	7.40	8.88	....	6.95	...	6.45	7.40	12.30	6.67	6.60	7.85
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	46.05	6.62	...	6.51	7.25	12.05	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.35	46.10	6.86	...	6.75	7.55	12.30	6.86	6.81	7.89
Cleveland	6.38	7.38	8.30	46.16	6.72	...	6.57	7.36	12.11	7.02	6.69	7.81
Detroit	6.57	7.57	8.63	43.50	6.90	7.36	6.79	7.54	12.25	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45*	....	6.69	6.52	7.64
Houston	7.35	7.80	9.99	....	7.70	9.30	7.70	9.30	....	7.60	7.35	8.75
Los Angeles	7.50	9.25	10.00	50.75	7.85	11.85	7.45	10.15	13.45	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.44	12.14	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.60	....	7.04	6.87	...
New York	6.97	7.91	8.84	44.95	7.56	...	7.37	8.73*	12.43	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.29	41.98*	6.96	8.80	6.74	7.86*	12.26	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.35	12.05	6.69	6.52	7.64
Portland, Oreg.	7.00	7.75	9.10	48.50	7.25	...	7.05	10.20	14.00	7.00	6.85	8.75
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.64	43.89	6.91	...	6.80	7.64*	12.34	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.01	....	7.35	7.18	8.30
San Francisco	7.70	9.10	9.60	51.65	7.95	...	7.50	10.20	13.50	7.65	7.55	9.60
Seattle	8.10	9.80	10.20	51.00	8.20	...	7.80	10.95	13.80	7.75	7.80	9.60
Spokane	8.35	9.65†	10.20	....	7.80	...	7.80	10.95‡‡	14.55	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **½-in. and heavier; ††as annealed; ‡‡under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 999 lb and in Los Angeles, 6000 lb and over; stainless sheets, 5000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; §—500 to 9999 lb; ¶—4000 lb and over; ‖—1000 to 1999 lb; #—1000 lb and over; †—1500 to 3999 lb; ‡—2000 to 3999 lb; ¤—f.o.b. local delivery in lots of 10,000 lb and over.

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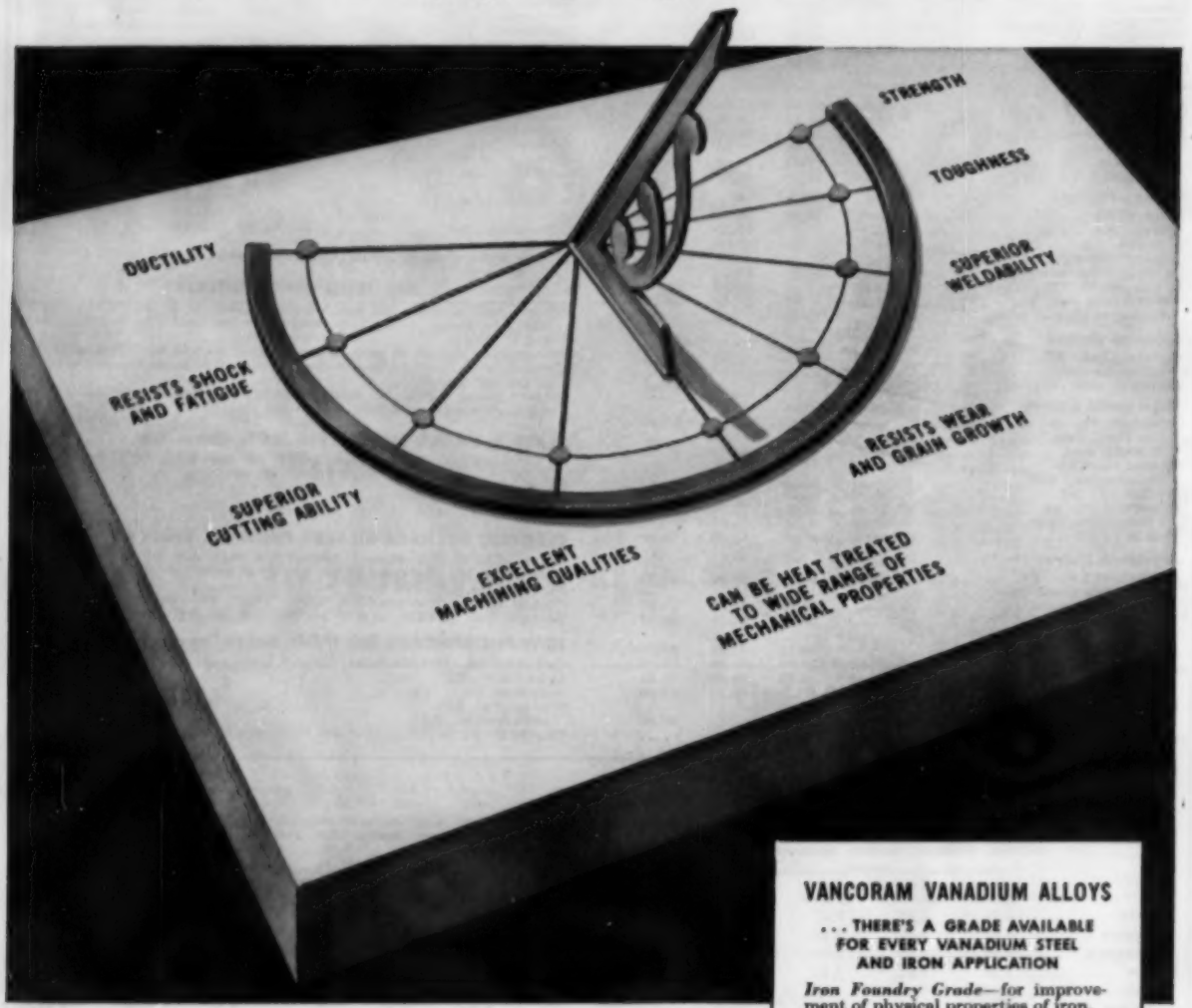

If you have a problem of meeting tough specifications, vanadium may help you do the job.

Either alone or in combination with other alloying elements, vanadium—in the form of Vancoram ferrovanadium—is one of the most versatile and dependable of alloying elements added to steel. It enhances the effect of other alloys and serves to improve the physical properties of the metal.

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Iron Foundry Grade—for improvement of physical properties of iron.
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Torque Bars Get Lift from Auto Boom

TORQUE BARS are having a big year, particularly because of their use in the auto industry. But look for them to show up in many other applications, such as machinery and appliances.

This product is made from .343-in.-diameter high-carbon, oil-tempered spring wire having a tensile strength of approximately 200,000 psi and a yield strength of not less than 150,000 psi. In the trunk lid of your car, one of these bars 43 in. long and weighing only 1¼ lb—can lift the lid with a force of nearly 400 in.-lb, according to Precision Spring Corp., Detroit.

Before and after forming, Precision Spring tests selected samples from each wire shipment from its supplier, Pittsburgh Steel Co. Stress-strain characteristics and formability must meet rigid specifications. If the wire were not uniform throughout, each bar would have to be tested individually, which would be too costly. Actually, less than one spring in a million ever fails in field service.

Steel Bars . . .

Bar Prices, Page 134

Hot-rolled carbon bar prices went up $7 per ton last week to $4.65 per 100 lb, f.o.b. mill, following the wage hike to the steelworkers. At the same time, cold-finished bars and hot-rolled alloy bars were advanced $10 per ton to $5.90 and $5.575 per 100 lb, f.o.b. mill, respectively.

Producers are opening their books for fourth-quarter orders. Third-quarter books now are full. In the East some interests are still in the process of lining up September schedules, with one large producer accepting tonnage on a September-October basis.

Summer vacations and hot weather are expected to cut into production somewhat over coming weeks.

Plates . . .

Plate Prices, Page 134

Most plate producers lost relatively little tonnage during the recent steel wage negotiations crisis. The Alan Wood Steel Co., Conshohocken, Pa., whose labor contract does not expire for about another month, lost no time.

Plate demand continues highly active and the higher prices, announced last week, are not expected to materially curtail buying. Railroad demand continues to increase and shipyard requirements, which have been lagging badly along with railroad needs, are also more promising.

Platemakers have done little so far on fourth quarter contract acceptances. Some are officially booking tonnage now for October, but not all. In few instances has tonnage been accepted for delivery beyond October, so far as can be learned, except in New England where sellers have opened fourth-quarter books at the new higher prices, though booking cautiously beyond October.

Scarcity of plates in New England is largely in sheared stock, third-quarter schedules being completely filled. Universal plates, however, can be supplied by some mills this quarter. Heads also are available for this delivery period.

Pittsburgh mills report third-quarter books are full. They are opening for fourth-quarter tonnage. Big taker of plates currently from mills in the area is the petroleum industry. Machinery builders are ordering heavily also, and substantial tonnage is going into construction. Railroad orders are picking up.

Sun Shipbuilding & Drydock Co. has been awarded a $10,942,000 contract to build a vehicle-carrying ship for the Navy. Three of six 25,000-ton tankers to be built by Bethlehem Steel Co. for the Military Transport Service will be constructed at the Quincy, Mass., yard.

Wire . . .

Wire Prices, Pages 136 & 137

Demand for manufacturers wire is good, but it is not as heavy as that for the flat-rolled products.

Requirements have been lightened a little by the reduced projections for automobile output.

Order backlogs for low carbon wire are 45 days; for high carbon wire, 45 to 60 days.

Demand for merchant wire is not as strong as that for manufacturers wire.

Wire mesh is in strong demand because of the heavy program of construction.

New prices were announced on various wire products by U. S. Steel Corp. early last week following the wage hike granted the steelworkers. Other makers were expected to take similar action.

Steel Export Prices Advance

United States Steel Export Co., New York, subsidiary of U. S. Steel Corp., announced a new schedule of prices to reflect higher wage costs resulting from the steel wage settlement. The new schedule became effective July 6. It follows:

EXPORT STEEL PRICES

Product	
Carbon Steels	Net ton
Billets, blooms & slabs, rerolling	$76.50
Billets, blooms, & slabs, forging	92.00
Tube rounds	111.00
Standard rails, 61 lb and over	101.20
Light rails, 60 lb and under	119.70
	Per 100 lb
Joint bars	$6.60
Hot-rolled bars and small shapes	5.10
Standard shapes	5.05
Skelp	4.85
C.B. sections and bearing piles	5.05
Plates	4.91
Sheet piling	5.86
Floor plates	5.98
Reinforcing bars	4.73
Cold-finished bars	6.27
Hot-rolled sheets (18-gage and heavier)	4.70
Cold-rolled sheets	5.91
Galvanized sheets	6.22
Hot-rolled strip	4.73
Vitrenamel sheets (12-gage)	6.56
Electrical sheets	10.35
Cold-rolled strip	6.83
Tight cooperage hoop	5.75
Wire Products	
Wire rods	5.21
Bright nail wire	6.42
Black annealed wire	7.17
Galvanized plain wire	7.74
ALLOY STEELS	Net ton
Billets, blooms & slabs	$104.00
	Per 100 lb
Hot-rolled bars	5.73
Plates	6.70
Standard shapes	6.05
Bar size shapes	6.10
Hot-rolled strip	7.63
Cold-finished bars	7.58
High Strength Steels	
Corten	
Plates	7.13
Standard shapes	7.15
C.B. sections	7.15
Hot-rolled bars and bar shapes	7.20
Man-Ten	
Plates	5.96
Standard shapes	6.00
C.B. sections	6.00
Hot-rolled bars and bar shapes	5.85

Sheets, Strip . . .

Sheet & Strip Prices, Page 135 & 136

Sharply higher prices were announced on the flat-rolled products last week by the U. S. Steel Corp. following the granting of a substantial wage increase to the steelworkers. Other producers were expected to take similar action promptly, probably before weekend in most instances.

Under the new schedule hot-rolled sheets are up $5.50 a ton to $4.325 per 100 lb mill; cold-rolled sheets, up $7.50 to $5.325; enameling sheets, $10.50 to $5.90; galvanized sheets, $8 to $5.85; electrical sheets, cut lengths, $17 to $9.95; hot-rolled strip $5.50 to $4.325; cold-rolled strip $14 to $6.45.

While expecting a reduction in automotive tonnage this quarter, sheet producers estimate they have all the business they can handle, especially as there may be some lag in production due to hot weather, staggering of schedules for vacations and need for certain maintenance work. Cushioning automotive cutbacks in their effect upon operations is a substantial carryover from last quarter, estimated to average around three weeks on hot and cold-rolled sheets.

At Chicago, the sheetmakers are sold out for third quarter and the feeling prevails that all orders on books are firm. If there is any easing ahead, however, this should become evident by mid-July. By then consumers will be revealing whether they have been in need of all the sheets they have been taking in recent weeks, or have been accepting tonnage as a strike hedge, or against a price increase.

Tin Plate . . .

Tin Plate Prices, Page 138

Indications are consumers of tin mill products will seek to get as much of their requirements delivered in third quarter as possible.

Current prices on tin mill items do not expire until Oct. 1 under present contracts. Since it is generally believed higher prices will be effected beginning fourth quarter, buyers can be expected to anticipate their needs as far as possible before that time.

Lead time on tin mill deliveries is six to seven weeks. Consequently, only September is open for increased shipments before the expected price advances are effected.

Chicago area producers expect lighter shipments this month but anticipate no reduction in output beyond that lost through the strike. Can makers have been taking heavy shipments as a strike hedge.

Steel Shipments Set Record

Shipments of finished steel products in May set a new monthly record at 7,540,889 net tons, reports the American Iron & Steel Institute. The previous monthly record was 7,436,919 tons established in March, 1953.

May shipments included new records for oil country goods, cold-rolled sheets and drawn wire. The total for oil country goods was 230,781 tons, for cold-rolled sheets, 1,278,892 tons, and for drawn wire, 300,611 tons.

The automotive industry continued to be the largest market classification, taking 1,672,828 tons, or 23.1 per cent of total domestic shipments. Warehouses and distributors constituted the second largest market with receipts totaling 1,405,427 tons, 19.4 per cent of total shipments for a new monthly record.

Structural Shapes . . .

Structural Shape Prices, Page 134

Structural business remains active and fabricators see considerable work ahead this summer.

May bookings of 304,498 tons were the highest since May, 1953, when 310,517 tons were placed, reports the American Institute of Steel Construction. Also, May tonnage increased about 53 per cent over that for the same month last year, and compared with a revised total of 270,226 tons in April this year.

Shipments in May of 233,184 tons were approximately 12 per cent below the corresponding total last year. Cumulative shipments for the first five months were 1,132,523 tons, against 1,331,532 in the like period of 1954. Also, May shipments were down from the revised total of 242,337 tons in April.

Order backlogs as of May 31 amounted to 1,592,384 tons, against 1,489,662 tons a year ago.

Unless competition eases, structural fabricating shops will experience difficulty passing on in full the increased cost of structurals. This is said to be true notably with respect to New England tonnage. Since contracts for 60,000 tons for the Massachusetts turnpike, first quarter to midyear, prices advanced approximately 10 per cent, starting at low level. This upward trend will be stimulated by the higher prices on plain material resulting from the recent wage increase granted the steelworkers.

Shops with bridge contracts for which structural shapes are yet to be delivered will operate at low margin on old firmer contracts. Where Pittsburgh producers are not equalizing on structurals moved into the East, available tonnage will be limited through rest of this year.

U. S. Steel Corp. is installing equipment at its Homestead Steel Works, Munhall, Pa., and at its South Works, South Chicago, Ill., so its wide flange beam output will have an increased proportion of lightweight sizes. Present mills were designed largely for heavy beams for tall structures. Most new buildings now are low and do not require heavy beams. The new equipment will be operating late this year.

New U. S. Steel Prices

(Concluded from page 46)

Pipe and tubular products:

	Amount of Increase
Buttweld standard pipe	
½"—3" T. & C.	$12.50 N.T.
½"—3" P. E.	10.50 N.T.
3½"—4" T. & C.	14.00 N.T.
3½"—4" P. E.	12.00 N.T.
Seamless standard pipe	
2"—4" T. & C.	14.00 N.T.
2"—4" P. E.	12.00 N.T.
Seamless line pipe	
5"—10" T. & C.	15.50 N.T.
5"—10" P. E.	11.50 N.T.
Seamless and electric weld line pipe	
12"—22" P. E.	11.00 N.T.
24"—36" P. E.	8.00 N.T.
Oil country casing, grade J-55—short T. & C., all sizes	11.60 N.T.
Oil country tubing, grade J-55—upset T. & C., all sizes	15.00 N.T.
Drill pipe, grade D, internal upset, all sizes	16.75 N.T.

(Increases in other sizes and grades of above pipe mill products are proportionate.)

Seamless Pressure and mechanical tubing	
Carbon	Approximately 8 per cent
Alloy	Approximately 6½ per cent

Stainless Steel . . .

Stainless Steel Prices, Page 138

Production of the 300 series of stainless steels is being limited by the insufficient supply of nickel. Nickel supplies to consumers are lower now than at any time this year. The government had thought summer vacations in the steel mills and fabricators' plants would lessen the need for nickel, so it set aside less for civilian use now and directed an increased amount to the national stockpile.

Also blamed for the acute situation in nickel are exports of nickel-bearing scrap. It's reported foreign buyers are offering a premium above the domestic price of such scrap.

The tightening in the nickel sup-

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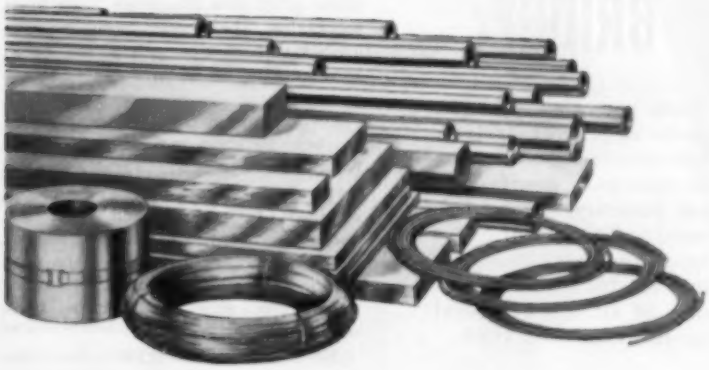

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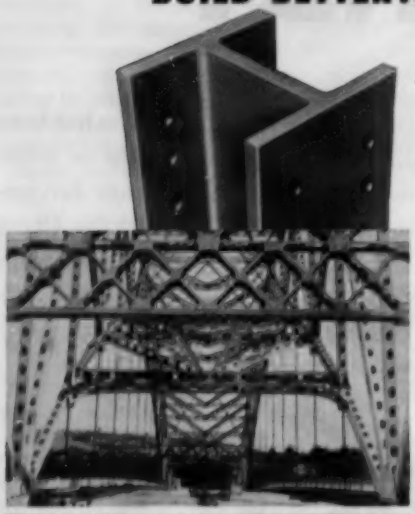

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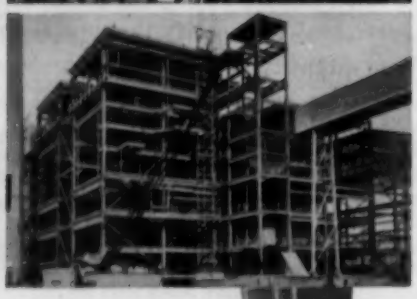

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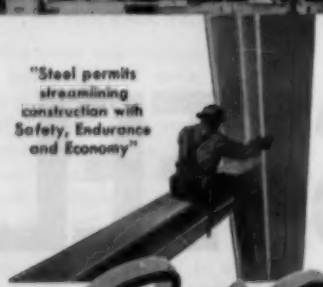

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ply led to a 5-cent-a-pound increase recently in 330 stainless steel, a type high in nickel content.

There was speculation the price increases to be made on steel as a result of the steelworkers' wage increase will not only include additional wage costs but also additional costs of nickel.

Stainless steel producers are planning to ask Washington to allot them more nickel. It wouldn't be surprising if the tight supply of stainless spurs cosumers to appeal, too, to Washington.

Stainless producers can't accept the government's belief that a big stockpile of nickel needs to be amassed. If an enemy attack knocked out some of the principal steel producing areas, there would be few plants left to use the nickel that had been piled up. Stainless producers believe the use of nickel now will help preserve a strong economy that would deter an aggressor.

Pig Iron . . .

Pig Iron Prices, Page 130

Speed with which blast furnaces were returned to operation following the short strike pretty well assures there will be no shortage of foundry iron in the third quarter. Since gray iron foundries have been increasing their operations a prolonged loss of iron production could have created an uncomfortable tightness.

Settlement of the steel wage controversy within a matter of hours after the strike deadline resulted in the loss of only a few days' output at blast furnaces which had been banked as a precautionary measure. Some operators estimated the loss at the equivalent of only two days' production; some, of course were not affected at all.

Movement of merchant iron was slow during the Fourth of July week, due primarily to suspensions at various foundries for mass vacations. As a number of shops will remain closed this week, the movement continues light.

Prices quoted by the Mystic iron works, Everett, Mass., for the third quarter will be unchanged at $61 f.o.b. furnace. This price, unchanged since March, 1954, applies to consumers with mutual contract agreements with Mystic, usually based on costs the preceding quarter. Costs at Everett have increased, but low operations hold tonnage below the rate on which costs are estimated.

While pig iron trading is expected to lag this month and next due to vacations and hot weather, higher prices are thought likely to be es-

tablished shortly by sellers. Some anticipate increases on ferromanganese also.

The Chester, Pa., blast furnace was scheduled to resume operations July 8 after having been banked several weeks.

Warehouse . . .

Warehouse Prices, Page 139

"There is no category that isn't in excellent demand." That is the way one midwestern warehouse official summed up the steel business.

What effect the short strike against major steel mills will have on the warehouse picture remains to be seen. It is safe to say, however, that the effect will be adverse.

Distributors in most districts are experiencing a growing tightness in supply. They expect the forced closedown of mills to shove deliveries back anywhere from a week to a month.

Low inventories have been hit hard as many consumers sought to "get in under the wire" of the steel-wage negotiations and the subsequent price increases. Hardest hit is structural steel which has been in strong demand for many weeks.

In the New England district, demand for steel from warehouses has been affected by the summer lull, but a trucking strike has been the most serious problem in distribution.

Distributors are increasing prices, including bases and service charges in most instances. Issuance of detailed price revisions will be delayed until action by the mills can be studied.

Warehouses are placing orders for more fourth-quarter tonnage where mills will book beyond October.

Canada . . .

Dominion Foundries & Steel Ltd. has placed in operation at its Hamilton, Ont., plant, Canada's first continuous galvanizing line. This is the second major installation of the company to start production in the past month. A 56-in. cold reduction strip mill began operating recently.

The company plans further expansion at Hamilton, including a second battery of coke ovens. Also, it is planning to manufacture chemicals beyond the usual by-products of coke production. Its new oxygen steel plant, placed in operation last fall, is the key to the proposed chemical expansion. About 400 tons of nitrogen are dissipated daily by the plant in making 100 tons of oxygen. This will be combined with hydrogen from the coke ovens to make anhydrous ammonia and other chemicals.

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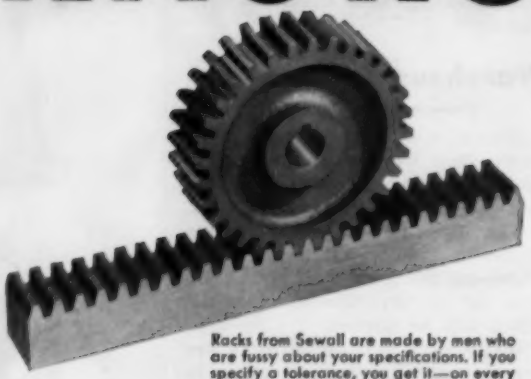

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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.

(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max. 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P. 0.04% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, C 0.025% max. (Simplex 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, S M x D, 18.35c per lb of alloy, ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.26 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.5c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.35c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.50c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.80-$6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min, C 0.30% max.) Ton lots, 2" x D, $4.65 per lb of contained Cb plus Ta, deld.; less ton lots $4.70.

Silicas Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 46c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5.7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal, Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn. $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa. $1.24.

FOR HOB THREADING:

• NON FERROUS METALS

...YOU NEED **HIGH SPEED!**

• HEAT TREATED MATERIALS

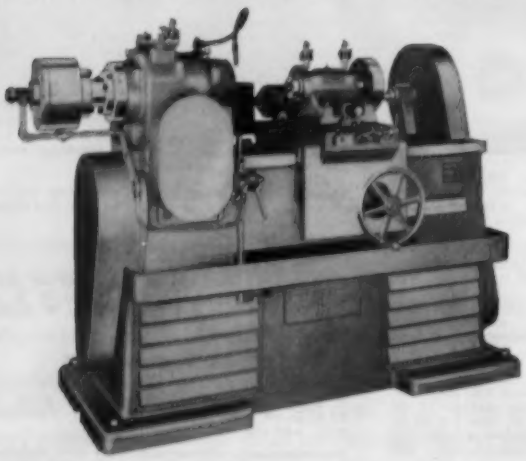
...YOU NEED **LOW SPEED!**

• VERY SHORT RUNS

...YOU NEED

QUICK CHANGEOVERS!

ONLY THE COULTER "H1" GIVES **ALL THREE!**



Yes sir, the COULTER "H1" Hob Thread Milling Machine is the only completely automatic machine that has such outstanding exclusive features for producing precision internal and external right-hand and left-hand threads — *ON A PRODUCTION BASIS!*

In addition, it's (a) fully AUTOMATIC, (b) works equally well with universal or air operated chucks, or, special fixtures, (c) has work spindle with an extra large hole, (d) work can be inserted from face to rear end, (e) has pick-off gears and an adjustable sheave drive. *It's the machine for you!*

EXTRA *For Brass, Aluminum and Steel.*
The "H1" makes provision for a separate motor to give the cutter and work spindle a larger range of speeds and feeds for threading these materials.

Send for complete information on the "H1" and other Coulter Automatic Threading Machines — no obligation.

MACHINE TOOL BUILDERS SINCE 1896

The James Coulter Machine Co.

631 Railroad Ave. Bridgeport 5, Conn.

HOT DIP GALVANIZING

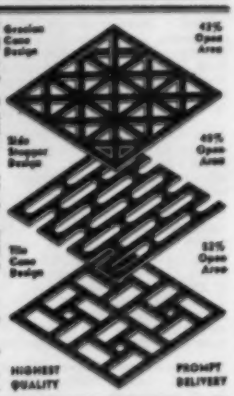
JOSEPH P. CATTIE & BROTHERS, INC.

2520 East Hagert Street

Phone: Re-9-8911 Philadelphia 25, Pa.

PERFORATED METALS

FOR EVERY INDUSTRIAL USE



The "Ornamental" light-gauge designs here illustrated are only a few of the many you can choose from in our new Catalog 39 and we are always pleased to quote on original designs or special work of any kind.

For larger unit-openings, using metals up to ¼" in thickness, we offer a wide variety of equally attractive designs in our Catalog 36 on Diamond Architectural Grilles.

Send us your blueprints. We are equipped to fabricate special sections to any desired extent and welcome opportunities to make money-saving suggestions.

DIAMOND MANUFACTURING CO.
Box 32 WYOMING (Wilkes-Barre Area) PENNA.

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SEAMLESS or WELDED
AIRCRAFT - MECHANICAL
PRESSURE - STAINLESS
STAINLESS PIPE & FITTINGS

SERVICE STEEL

DETROIT - BUFFALO - CHICAGO - CINCINNATI - LOS ANGELES

TOLEDO STAMPINGS

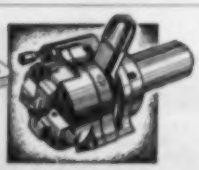
Let us make your stamping problems our problems. Our Engineering Department has had many years of experience in development work and our production facilities include not only a modern press department, but facilities for copper hydrogen brazing and other types of welding and assembling work. We solicit your prints and inquiries.

Toledo Stamping and Manufacturing Co.

90 Fearing Blvd., Toledo, Ohio

Detroit Office: 14225 Schaefer Road, Detroit 27, Michigan
Chicago Office: 333 North Michigan Ave., Chicago, Ill.

H&C Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Barbringer, Inc., 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada.*

ABC OF IRON AND STEEL **$10.00**
Fifth Edition, 440 pages, Illustrated POSTPAID

This book brings together the combined knowledge and experience of 31 outstanding authorities and takes one step by step through steelmaking. Representing years and years of constant work and study, "ABC" is the result of actual first-hand experience. It is written in simple, non-technical language, and hundreds of photographs of operations and equipment are included. **The Penton Publishing Co., Book Department, 1213 W. 3rd St., Cleveland 13, O.**

Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld, E. Pa.

Foundry and basic 52-62% concentrates contract 17.00-19.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	30.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$31.50-$32.00
Domestic, scheelite, mine	62.00

Manganese Ore

Mn 48%, nearby, 85c-87c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$52.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked $1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

56-60%	$3.50-$3.80
60-65%	3.80-4.25

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	21.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $130; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $142.

Semisilica Brick (per 1000)

Clearfield, Pa. $130; Philadelphia, $116; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $189.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $235; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $290; Danville, Ill., $258; Clearfield, Pa., $367.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $143.50; St. Louis, $150.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $250.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.60.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.60; St. Louis, $195.80; Athens, Tex., $191.50.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned, bulk, ¼-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.50
Camden, N. J., ovens	24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, Ind., ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	24.00
Swedeland, Pa., ovens	24.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	24.25
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.50
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

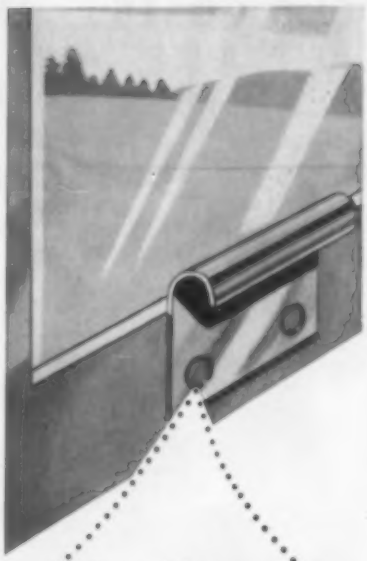
Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Diam (Inches)	Length	Per 100 lb
2	24	$47.75
2½	30	30.75
3	40	30.00
4	40	28.50
5½	40	28.25
6	60	25.50
7	60	25.25
8, 9, 10	60	22.75
12	72	24.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25

CARBON

8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	10.25
17	72	9.85
20	84	9.85
20	90	9.65
24	72, 84	9.85
24	96	9.60
30	84	9.75
40,35	110	9.50
40	100	9.50



An Alcoa Aluminum Fastener should be used here!

It's an aluminum window-lift assembly, worth the lasting strength of Alcoa® Aluminum Fasteners. You avoid galvanic and atmospheric corrosion. You get perfect color match; you get the very highest quality product. Your local Alcoa distributor has a complete stock.

P. S. In this window-lift assembly, we suggest an aluminum 78° countersunk rivet from Alcoa's complete line of aluminum fasteners.

Aluminum Company of America
2250-G Alcoa Building, Pittsburgh 19, Pa.
Gentlemen:
Please send complete specification data and samples of your aluminum fasteners.

name _____
title _____
company _____
address _____

Always Fasten Aluminum with Alcoa Aluminum Fasteners

CUT COSTS...INCREASE PROFITS—AUTOMATICALLY
KEEP AISLES AND LOADING AREAS FREE OF TRAMP IRON—RECOVER VALUABLE SCRAP

HOMER MAGNETIC FLOOR SWEEPERS

...an absolute essential for up-to-date plants

... You can save valuable time—labor—maintenance and lost production by keeping factory aisles and loading areas free from tramp iron, with Homer Magnetic Floor Sweepers.

... You can recover valuable ferrous scrap from factory floors and increase the safety factor in your plant, by keeping areas around machines free from dangerous sharp chips and turnings.

For complete information on how Homer Magnetic Floor Sweepers can effect big savings for you in labor—time—maintenance and safety, we suggest you write us today requesting copy of Bulletin MS-250.

THE HOMER MANUFACTURING CO., INC.
DEPT. 149 **LIMA, OHIO**

...the FINEST in Permanent Magnetic Equipment for Industry

FASTER! EASIER!

CUT COSTS UP TO 50%
WITH REN-ITE TOOLING PLASTIC

The trend is definitely to Ren-ite Tooling Plastics for lower costs. Look at your tooling requirements . . . you'll find that Ren-ite Tooling Plastics can replace steel or other metals at a fraction of your present cost. Efficiency of operation is another Ren-ite Plus.

This Ren-ite Master Body Checking fixture for a 1955 automobile reduced tooling weight from 2350 to 635 lbs. and cut costs approximately 50%. One of many Ren-ite tooling accomplishments.

Ren-ite the dependable dimensionally stable tooling plastic is a thermosetting resin used as a laminating plastic without heat or pressure for general tooling applications. Ren-ite is used successfully for models, prototypes, spotting racks, panels, forming dies, duplications as well as checking, welding, drill and router fixtures. Foundry applications are being developed.

Ren-ite research and engineering are available at no cost to you. No contract needed.

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FREE BOOKLET

...tells how to judge diamond quality.

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Elgin Diamond is the standard for industrial diamond quality. Only Elgin offers this Master Comparison Gage to let you check your own diamond for grading and purity.

ABRASIVES DIVISION, DEPT. 8

ELGIN NATIONAL WATCH COMPANY
ELGIN ILLINOIS

Scrap . . .

Scrap Prices, Page 152

Pittsburgh—The scrap market is displaying new strength here. Prices moved up the past week with a brokerage firm reportedly purchasing No. 1 heavy melting steel for delivery to a district steel producer at $38.50. The mill also took a tonnage of No. 2 heavy melting at $35.50, delivered.

Scrap buyers of other district mills said they did not plan any immediate purchases, at least they would not re-enter the market until steelmaking operations had fully recovered from the curtailment occasioned by the short-lived steel strike.

Philadelphia — Scrap prices are strong, and while there are no changes in the major open-hearth grades, machine shop turnings and mixed borings and turnings are higher at $23.50, delivered, short shovel turnings at $26, heavy turnings at $34-$35, and couplers, springs and wheels at $41.50.

Contributing to strength is the inflationary boost being given commodities generally by the higher prices in steel and related products, following the recent steel wage hike.

Cast iron grades are temporarily unchanged but higher prices are expected should an increase in pig iron become fully established. Among weakening factors in cast here is the continued strike at the Florence, N. J., pipe foundry, which entered its sixth week last Monday.

New York—Scrap brokers' buying prices are strong but unchanged. There is a fairly good sprinkling of consumer orders, none of which, however, is particularly outstanding. Yardmen still report light collections.

Cleveland—Settlement of the steel strike without a prolonged shutdown of steelmaking operations has served to strengthen the scrap market sentimentally. Prices, however, are unchanged from a week ago with buying absent. Dealers and brokers anticipate a renewal of purchasing once mill operations have recovered fully from the strike setback though they are uncertain whether vacation interruptions in mill schedules and hot weather will restrict activity over July and August. Foundry demand for scrap is expected to pick up noticeably in event pig iron prices rise.

Cincinnati—The local scrap market is considerably stronger than it has been for some time. Upward adjustments averaging $3 to $4 per ton on most grades have been effected. Brokers believe July will see prices edging higher. Scrap production here continues sufficient to match demand of the mills in this area.

Chicago—The stronger tone which has been developing in the scrap market has resulted in another price advance with all important grades rising at least $1 a ton and a few as much as $2 or $3. In addition, broker-dealer trading is the most active it has been for many weeks. Shortness of the steel strike is a bolstering influence in the scrap market because consumption was interrupted only momentarily.

Birmingham—The local scrap market was inactive last week with the two largest district consumers holding up shipments pending outcome of steel wage negotiations. New selling lists released by the railroads were slightly higher reflecting, sentimentally, strength in northern markets. Cast iron grades remain strong, with some specialties slightly higher.

Seattle—The scrap market remains firm and active. Prices are unchanged. Conditions are favorable for collectors and receipts from the interior are heavy. Weakness, sensed by dealers last month, has not developed and the present situation is expected to continue.

Scrap exporters expect a moderate flow of shipments from the North Pa-

(*Please turn to page* 154)

33% DECREASE IN DIE WEAR ON THIS GRAY IRON FITTING

...thanks to

FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE... because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 55, Niagara Falls, N.Y.

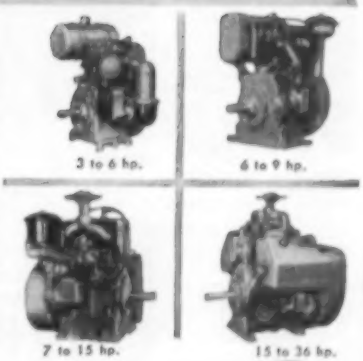
CARBORUNDUM®

Most Specified for ORIGINAL EQUIPMENT POWER

WISCONSIN

HEAVY-DUTY Air-Cooled ENGINES

3 TO 36 HORSEPOWER



In the design, manufacture, and ultimate use-purchase of mechanized field and industrial equipment . . . Wisconsin Heavy-Duty Air-Cooled Engines are specified as Original Equipment Power Components to a greater extent than any other make of engine, within a 3 to 36 hp. range.

This dominant preference must necessarily be based on actual *performance records* of users . . . because Wisconsin Engines are not sold on a "price" basis. These engines have the inherent Lugging Power that *stays with the job,* eliminating "stop-and-go" delays, saving manpower and manhours . . . and delivering "Most H. P. Hours" of on-the-job service, with minimum servicing.

If this makes sense to you, let's get together. Write for engineering and descriptive data.

Power TO FIT THE JOB

Power TO FIT THE MACHINE

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

A 7991-1½

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

July 6	$37.83
June 29	36.50
June Avg.	35.44
July 1954	27.42
July 1950	37.04

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting	*38.50*
No. 2 heavy melting	*35.50*
No. 1 bundles	*38.50*
No. 2 bundles	*28.00-29.00*
No. 1 busheling	*38.50*
Machine shop turnings	20.50-21.50
Mixed borings, turnings	20.50-21.50
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals, 3 ft lengths	*38.00-39.00*
Heavy turnings	33.00-34.00
Punchings & plate scrap	39.00-40.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	34.00-35.00
Heavy breakable cast	34.00-35.00
Unstripped motor blocks	25.00-26.00
No. 1 machinery cast	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Rails, 2 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, random lengths	45.00-46.00
Railroad specialties	43.00-44.00

Stainless Steel Scrap

18-8 bundles & solids	*240.00-250.00*
18-8 turnings	*110.00-120.00*
430 bundles & solids	100.00-105.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumers's plant)

No. 1 heavy melting	34.50-35.50
No. 2 heavy melting	28.50-29.50
No. 1 bundles	34.50-35.50
No. 2 bundles	24.00-25.00
No. 1 busheling	34.50-35.50
Machine shop turnings	19.00-20.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Low phos.	34.00-35.00
Cut structural plates 2 ft and under	42.00-43.00
Alloy free, short shovel turnings	28.50-29.50
Electric furnace bundles	35.50-36.50

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	38.00-39.00
Stove plate	44.00-45.00
Heavy breakable cast	34.00-35.00
Unstripped motor blocks	26.00-27.00
Brake shoes	33.00-34.00
Clean auto cast	45.00-46.00
Burnt cast	34.00-35.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
R.R. malleable	46.00-47.00
Rails, 2 ft and under	50.00-51.00
Rails, 18 in. and under	51.00-52.00
Rails, random lengths	45.00-46.00
Cast steel	40.00-41.00
Railroad specialties	41.00-42.00
Uncut tires	44.00-45.00
Angles, splice bars	46.00-47.00
Rails, rerolling	55.00-56.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	240.00-250.00
18-8 turnings	110.00-120.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer's plant)

No. 1 heavy melting	37.00-38.00
No. 2 heavy melting	32.00-33.00
No. 1 bundles	37.00-38.00
No. 2 bundles	26.00-27.00
No. 1 busheling	37.00-38.00
Machine shop turnings	20.50-21.50
Short shovel turnings	26.00-27.00
Cast iron borings	26.00-27.00
Low phos.	38.00-39.00
Electric furnace bundles	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00

CHICAGO

No. 1 heavy melting	*35.00-37.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 factory bundles	*37.00-38.00*
No. 1 dealer bundles	*34.00-35.00*
No. 2 bundles	24.00-25.00
No. 1 busheling	*35.00-37.00*
Machine shop turnings	*20.00-21.00*
Mixed borings, turnings	*22.00-23.00*
Short shovel turnings	*22.00-23.00*
Cast iron borings	*22.00-23.00*
Cut structurals, 3 ft	*38.00-39.00*
Punchings & plate scrap	*39.00-40.00*
Electric furnace bundles	*37.00-38.00*

Cast Iron Grades

No. 1 cupola	*43.00-44.00*
Stove plate	*35.00-36.00*
Unstripped motor blocks	*30.00-31.00*
Clean auto cast	*47.00-48.00*
Drop broken machinery	*48.00-49.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*39.00-40.00*
R.R. malleable	*46.00-47.00*
Rails, 2 ft and under	*51.00-52.00*
Rails, 18 in. and under	*52.00-53.00*
Angles, splice bars	*47.00-48.00*
Rails, rerolling	*55.00-56.00*

Stainless Steel Scrap

18-8 bundles & solids	*255.00-265.00*
18-8 turnings	*130.00-140.00*
430 bundles & solids	100.00-105.00
430 turnings	45.00-50.00

Chicago Mercantile Exchange

(Week ended July 6)

	High	Low	Close
No. 1 Heavy Melting			
	High	Low	Close
Oct.	....	....	36.00*
Jan.	....	....	....

Sales (160-ton units): None.
*Nominal

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	27.50
No. 2 heavy melting	21.00
No. 1 bundles	27.50
No. 2 bundles	19.00
No. 1 busheling	27.50
Machine shop turnings	13.00
Mixed borings, turnings	13.00
Short shovel turnings	16.50
Punchings & plate scrap	33.00

Cast Iron Grades

Charging box cast	28.00
No. 1 cupola	37.00
Stove plate	32.00
Heavy breakable	28.00
Unstripped motor blocks	20.00
Clean auto cast	42.00
Malleable	36.00

BIRMINGHAM

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-33.00
Cast iron borings	15.00-16.00
Short shovel turnings	24.00-25.00
Machine shop turnings	18.00-19.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	36.00-37.00
Structural plate, 2 ft	36.00-37.00
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-36.00
Rails, 2 ft and under	44.00-45.00
Rails, 18 in. and under	45.00-46.00
Rails, rerolling	52.00-44.00
Rails, random lengths	40.00-41.00
Angles, splice bars	43.00-44.00
Std. steel axles	35.00-36.00

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting	39.00
No. 2 heavy melting	34.00
No. 1 bundles	39.00
No. 2 bundles	30.00*
No. 1 busheling	39.00
Electric furnace bundles	*41.00*
Machine shop turnings	*22.50*
Mixed borings, turnings	*22.50*
Short shovel turnings	*26.00*
Structurals & plate	41.00-42.00
Heavy turnings	*34.00-35.00*
Couplers, springs wheels	*41.50*
Rail crops, 2 ft & under	50.00-51.00

Cast Iron Grades

No. 1 cupola	36.00
Malleable	45.00
Heavy breakable cast	42.00
Drop broken machinery	45.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	30.00-31.00
No. 1 bundles	34.00-35.00
No. 2 bundles	23.00-24.00
Machine shop turnings	15.00-16.00
Mixed borings, short turnings	16.00-17.00
Short shovel turnings	17.00-18.00
Low phos. (structural & plate)	36.00-37.00

Cast Iron Grades

No. 1 cupola	31.00-32.00
Unstripped motor blocks	21.00-22.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	225.00-240.00
18-8 borings, turnings	110.00-115.00
430 sheets, clips, solids	95.00-100.00
410 sheets, clips, solids	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	22.00-22.50
No. 1 bundles	28.00-29.00
No. 2 bundles	20.00-21.00
Machine shop turnings	12.00-12.50
Mixed borings, turnings	15.00-15.50
Short shovel turnings	16.00-16.50
No. 1 cast	31.00-32.00
Mixed cupola cast	29.00-30.00
No. 1 machinery cast	34.00-35.00

BUFFALO

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	29.00-30.00
No. 2 bundles	23.00-24.00
No. 1 busheling	29.00-30.00
Mixed borings, turnings	20.50-21.50
Machine shop turnings	19.00-20.00
Short shovel turnings	21.50-22.50
Cast iron borings	20.50-21.50
Low phos.	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	36.00-37.00
No. 1 machinery	41.00-42.00

Railroad Scrap

Rails, random lengths	35.00-36.00
Rails, 3 ft and under	42.00-43.00
Railroad specialties	36.50-37.50

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*34.00-35.00*
Machine shop turnings	*19.00-20.00*
Mixed borings, turnings	*19.50-20.00*
Short shovel turnings	*22.00-23.00*
Cast iron borings	*19.50-20.50*
Low phos., 18 in.	*40.00-41.00*

Cast Iron Grades

No. 1 cupola	*42.00-43.00*
Heavy breakable cast	*35.00-36.00*
Charging box cast	38.00
Drop broken machinery	*46.00-47.00*

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-34.00
Rails, 18 in. and under	47.00-48.00
Rails, random lengths	*41.00-42.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	30.00
No. 2 bundles	23.50
Machine shop turnings	15.00
Short shovel turnings	17.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	35.00
Heavy breakable cast	33.00
Unstripped motor blocks	33.00
Brake shoes	32.00
Clean auto cast	43.00
Stove plate	33.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.50
Rails, 18 in. and under	46.00
Rails, random lengths	40.00
Rails, rerolling	51.00
Angles, splice bars	41.00

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00
No. 1 bundles	35.00
No. 2 bundles	23.00
No. 3 bundles	16.00-17.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	15.00-16.00
Electric furnace, No. 1	39.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	38.00-40.00
Heavy breakable cast	28.00
Unstripped motor blocks	30.00-32.00
No. 1 wheels	24.00-25.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap

(Delivered consumer's plant)

Rails, random lengths	34.00

LOS ANGELES

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	29.00
No. 2 bundles	23.00
Machine shop turnings	8.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	*32.00*
No. 2 heavy melting	*30.00*
No. 1 bundles	*32.00*
No. 2 bundles	*27.00*
No. 1 busheling	*32.00*
Machine shop turnings	*12.00*
Mixed borings, turnings	*12.00*
Short shovel turnings	*14.00*
Cast iron borings	*14.00*
Cut structurals	*34.00*
Heavy turnings	*12.00*
Punchings & plate scrap	*32.00*

Cast Iron Grades

No. 1 cupola	40.00-43.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Mixed borings, turnings	18.00
Rails, remelting	43.00
Busheling, new factory: Prepared	32.50
Unprepared	28.00
Short steel turnings	16.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.

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(*Concluded from page 151*)

cific to Japan. At present Dulien Steel Products Co. is sending two full cargoes.

Los Angeles—Dealers report first-half business was at least 15 per cent better than that in the like period last year. Although some foreign scrap is on the market, sales of domestic grades are expected to maintain their high level through July.

San Francisco—Responding to the pressure of export demand, steel scrap prices have advanced $2 a ton. No. 1 heavy melting now is quoted $32 a ton.

Tool Steel . . .

Tool Steel Prices, Page 138

Shipments of high speed and tool steel (excluding hollow drill steel) totaled 10,067 net tons in May, reports the American Iron & Steel Institute. This was an increase compared with shipments of 9786 tons in April and was substantially above the 6300 tons moved in May a year ago. Actually, shipments in May were the largest for any month since June, 1953 when 11,505 tons were moved.

Cumulative shipments in the first five months this year amounted to 45,287 net tons. In the like period of 1954 the total was 37,599 tons.

Iron Ore . . .

Iron Ore Prices, Page 140

Shipments of Lake Superior iron ore totaled 2,993,766 gross tons in the week ended July 4, reports the Lake Superior Iron Ore Association. This was the second largest weekly tonnage moved to date this season and was more than 300,000 tons above the movement in the like week of 1954. Cumulative shipments for the 1955 season to July 4 stand at 29,360,254 tons, approximately 6 million tons above shipments to the like date in 1954.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

9700 tons, pelletizing plant building, Erie Mining Co., Aurora, Minn., to Bethlehem Steel Co., Bethlehem, Pa.

5590 tons, Bank of New York office building, 530 Fifth Ave., Manhattan, N. Y., through Starrett Bros. & Eken, to Dreier Structural Steel Co. Inc., Long Island City, N. Y.

4075 tons, section of Patapsco tunnel, Baltimore, to Merritt-Chapman & Scott Corp., New York, to Bethlehem Steel Co., Bethlehem, Pa.

3060 tons, state bridge work, Genesee county, New York, through Poirier & McLane, general contractors, to Bethlehem Steel Co., Bethlehem, Pa.

2255 tons, overpasses, contract P-6, Gloucester-Philadelphia bridge, placed by Delaware River Port Authority with Bethlehem Steel Co., Bethlehem, Pa.

1800 tons, power plant extension, Boston Edison Co., Everett, Mass., to Ingalls Iron Works, Birmingham.

1000 tons, five bridges, Massachusetts turnpike, Chicopee, Mass., to Haarmann Struc-

tural Steel Co., Holyoke, Mass.; L. G. DePalice & Sons, Inc., New Haven, Conn., general contractor.

910 tons, upper roadway, contract 3, Queensboro bridge, New York, through Woodcrest Construction Co., general contractor, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

800 tons, plant building, American Can Co., Arlington, Tex., to an unnamed fabricator.

795 tons, viaduct, Shreveport, La., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Austin Bridge Co., Dallas, Tex.

400 tons, sewer section, Brighton district, Boston; Peter Kiewit Sons Co., Philadelphia, low, general contract, Metropolitan District Commission, Boston.

387 tons, state bridge work, Bergen county, New Jersey, bids to be opened by the State Highway Department, Trenton, July 26; 188 tons of reinforcing steel also required.

385 tons, Ferry Point international bridge, Calais, Me.-St. Stephen, N. B., to Dominion Bridge Co., Montreal, Canada, through Tryner Construction Co., Halifax, N. S., general contractor; reinforcing bars to Bancroft & Martin Rolling Mills Co., South Portland, Me.

375 tons, reinforced concrete deck, bridge, Massachusetts turnpike, West Springfield-Chicopee, Mass.; Daniel O'Connell's Sons Co. Inc., Holyoke, Mass., low, general contract.

350 tons, maintenance shop building, Mt. Rainier Ordnance Depot, Washington state, to Isaacson Iron Works, Seattle; Roy T. Earley, Tacoma, Wash., general contractor.

300 tons, pipe galleries, Erie Mining Co., Aurora, Minn., to Bethlehem Steel Co., Bethlehem, Pa.

210 tons, state highway bridge, Waterbury, Vt., to American Bridge Division, U. S. Steel Corp., Pittsburgh; O. W. Miller Co. Inc., Ludlow, Vt., general contractor.

190 tons, government-furnished, towers, etc., military installation, Ohlson Mountain, Alaska; Chris. Berg Inc., Seattle, general award at $1,897,184.

177 tons, state bridge work, route 4, sections 5-C and 4-F, Bergen county, New Jersey, bids to be opened by the State Highway Department, Trenton, July 26; 150 tons of reinforcing steel also required.

140 tons, classified project, Hanford Works, to Pacific Car & Foundry Co., Seattle; L. H. Hoffman, Portland, Oreg., general contractor.

135 tons, warehouse, Sylvania Electric Products Co., Atlanta, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

110 tons, warehouse, Elizabeth, N. J., through David O. Evans, contractor, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, factory, Teterboro, N. J., through Bergen Engineering Co., to Grandview Structural Steel Co.

STRUCTURAL STEEL PENDING

2611 tons, state bridge work, Camden and Gloucester counties, New Jersey, bids July 26; also required are 825 tons of reinforcing steel.

2280 tons, state bridge work, section 37-AB, Carbon county, Pa., and section 37-DE, Luzerne county, Pa.; Bethlehem Steel Co., Bethlehem, Pa., is low bidder.

1140 tons, Youth Shelter, Department of Public Works, Bronx, New York, Gerace & Castagno, low on general contract.

1025 tons, research center, laboratory and office, Esso Standard Oil Co., Linden, N. J., bids closed.

1000 tons, Naval maintenance hangar, Whidbey Island, Washington state; James I. Barnes Construction Co., Seattle, low at $2,855,000.

600 tons, approximately, New York approach, third tube, Lincoln tunnel, Port of New York Authority, New York, bids closed July 12.

150 tons, state bridge work, Lancaster county, Pa., bids July 29.

108 tons, state bridge work, Warren county, Pa., bids July 29.

REINFORCING BARS . . .

REINFORCING BARS PLACED

241 tons, Carnation Co. processing plant, Seattle, to Northwest Steel Rolling Mills Inc., Seattle.

SALES ENGINEERS

Well known, highly regarded manufacturing company in Wisconsin is anxious to add young Sales Engineers to its staff. Must have at least four years of sales experience, particularly capital goods. Age 25-30. Engineering degree desirable. Opportunity unlimited for outstanding young men. Salary appropriate. Replies held in complete confidence.

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235 tons, viaduct, Shreveport, La., to Austin Bros., Dallas, Tex.

188 tons, state bridge work, route 17, section 9-B, Bergen county, New Jersey, bids to be opened by the State Highway Department, Trenton, July 28; 387 tons of structural steel also required.

160 tons, utilidors and other facilities, Eielson Air Field, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Boen-Eggs and partners, Seattle, joint contractors, low at $1,346,602.

150 tons, state bridge work, route 4, sections 5-C and 4-F, Bergen county, New Jersey, bids to be opened by the State Highway Department, Trenton, July 28; 177 tons of structural steel also required.

100 tons, merchandise center, Missoula, Mont., to Bethlehem Pacific Coast Steel Corp., Seattle.

90 tons, Army installation, Ohlson Mountain, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

80 tons, addition to University Temple, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; John H. Sellen Construction Co., Seattle, general contractor.

REINFORCING BARS PENDING

825 tons, state bridge work, Camden and Gloucester counties, New Jersey, bids close July 28; also required are 2611 tons of structural steel.

117 tons, including 55 tons of shapes, Washington state road projects, Benton and Lewis counties; bids to Olympia, Wash., July 19.

100 tons or more, guided missile project, Vashon Island, Washington; John H. Sellen Construction Co., Seattle, low at $710,610.

60 tons, plus other metals, Bureau of Roads, bridge in Rainier National Park, Washington state; bids to Portland, Oreg., July 13.

PLATES . . .

PLATES PLACED

360 tons, five steel stacks, Public Service Electric & Gas Co., Linden, N. J., to Corberey Construction Co.

200 tons, oil storage tanks, Navy installation, Klamath Falls, Oreg., to Hammond Iron Works, Provo, Utah; Morrison-Knudsen Co., Seattle, general contractor.

100 tons, storage tank, Parma, Idaho, to Chicago Bridge & Iron Co., Seattle.

100 tons, water storage tank, Poulsbo, Wash., to Chicago Bridge & Iron Co., Seattle.

PIPE . . .

CAST IRON PIPE PLACED

100 tons or more, to Pacific States Cast Iron Pipe Co., Seattle, low at $26,760, by Bremerton, Wash.

CAST IRON PIPE PENDING

500 tons or more, 12-in., ball and joint; bids to Montesano, Wash., July 12.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Seaboard Airline, ten 1750-hp diesel road switchers to the Electro-Motive Division, General Motors Corp., La Grange, Ill.

Midland of Manitoba, one 900-hp diesel switcher to General Motors Diesel Ltd., Hamilton, Ont.

New York, New Haven & Hartford, two 1700-hp diesel-electric locomotive units to ACF Industries Inc., New York.

RAILROAD CARS PLACED

Southern Pacific, 960 box cars, 750 going to its own shops and 150 to Pullman-Standard Car Mfg. Co., Chicago.

Gulf, Mobile & Ohio, 400 fifty-ton box cars to ACF Industries Inc., New York.

Kansas City Southern, 300 fifty-ton box cars to ACF Industries Inc., New York.

St. Louis-Southwestern, 75 fifty-ton flat cars to the Greenville Steel Car Co., Greenville, Pa.

Maine Central, 250 box cars to the ACF Industries Inc., New York.

Chicago & North Western, 16 air-conditioned suburban coaches to the Pullman-Standard Car Mfg. Co., Chicago.

Advertising Index

Aeroquip Corporation ... 72
Alliance Machine Co., The ... 110
Allied Chemical & Dye Corporation, General Chemical Division ... 69
Allis-Chalmers ... 29
Aluminum Company of America ... 149
American Steel Foundries, Elmes Engineering Division ... 54
Anaconda Wire & Cable Co. ... 97
Armco Steel Corporation ... 42
Armstrong Cork Co. ... 95
Atlantic Refining Co., The ... 24
Atlas Mineral Products Co. ... 120

Babcock & Wilcox Co., The, Tubular Products Division ... 79
Bardons & Oliver, Inc. ... 7
Beryllium Corporation, The ... 154
Bethlehem Steel Co. ... 1, 158
Bolling, Stewart, & Co. ... 155
Brandt, Charles T., Inc. ... 133
Buffalo Bolt Co., Division of Buffalo-Eclipse Corporation ... 78
Bullard Co., The ... 58
By-Products Steel Co., A Division of Lukens Steel Co. ... 37

Cadman, A. W., Mfg. Co. ... 146
Carborundum Co., The ... 16, 151
Carpenter Steel Co., The ... 122
Cattie, Joseph P., & Brothers, Inc. ... 148
Chase Brass & Copper Co. ... 143
Chicago Tramrail Corporation ... 76
Chrysler Corporation, Industrial Engine Division ... 71
Clark Equipment Co., Industrial Truck Division ... 121
Cleveland Punch & Shear Works Co., The ... 102
Cleveland Worm & Gear Co., The ... Inside Back Cover
Colorado Fuel & Iron Corporation, The, Wickwire Spencer Steel Division ... 100, 101
Columbia-Geneva Steel Division, United States Steel Corporation ... 129
Cone Automatic Machine Co., Inc. ... 21
Copperweld Steel Co., Ohio Seamless Tube Division ... 86
Copperweld Steel Co., Steel Division ... 61
Coulter, James, Machine Co., The ... 148
Crucible Steel Company of America ... 19
Custom Die Co. ... 64
Cutler-Hammer, Inc. ... Back Cover

Diamond Manufacturing Co. ... 148
Dravo Corporation ... 117
Drop Forging Association ... 123
Dykem Co., The ... 146

Eastern Machine Screw Corporation, The ... 148
Electric Controller & Mfg. Co., The ... Inside Front Cover
Elgin National Watch Co., Abrasives Division ... 150
Elmes Engineering Division, American Steel Foundries ... 54
Erie Bolt & Nut Co. ... 124

Fellows Gear Shaper Co., The ... 13
Penn Manufacturing Co., The ... 10
Fort Pitt Bridge Works ... 144
Frasse, Peter A., & Co., Inc. ... 11

General Chemical Division, Allied Chemical & Dye Corporation ... 69
General Electric Co. ... 26, 27
Goodyear Tire & Rubber Co., The, Industrial Products Division ... 4
Gould-National Batteries, Inc. ... 41
Gray Iron Founders' Society, Inc. ... 118

Hanna Furnace Corporation, The ... 6
Homer Manufacturing Co., Inc., The ... 150
Hoover Ball & Bearing Co. ... 5
Horsburgh & Scott Co., The ... 114
Hyde Park Foundry & Machine Co. ... 157
Hydroway Scales, Inc. ... 146

Ingalls Iron Works Co., The ... 119
Iron & Steel Products, Inc. ... 155
Ironsides Co., The ... 36

Jessop Steel Co. ... 17
Jones & Lamson Machine Co. ... 8, 9
Jones & Laughlin Steel Corporation ... 115

Kaiser Aluminum & Chemical Sales, Inc., Kaiser Chemicals Division ... 74, 75, 131
Keystone Carbon Co., Powdered Metal Division ... 23
Kinnear Mfg. Co., The ... 84
Kling Bros. Engineering Works ... 3

Lake Erie Engineering Corporation ... 104, 105
Lovinson Steel Co., The ... 125
Lukens Steel Co. ... 80
Lukens Steel Co., By-Products Steel Co. Division ... 37
Lurie Brothers & Co., Inc. ... 153

McKay Machine Co., The ... 53

Marchant, Geo. F., Co. ... 156
Markem Machine Co. ... 124
Milford Rivet & Machine Co., The ... 16
Monarch Machine Tool Co., The ... 77
Morse Twist Drill & Machine Co. ... 14, 15

National Machine Tool Builders' Association ... 22
National Roll & Foundry Co., The ... 126
National Steel Corporation ... 6, 31
North Carolina Department of Conservation & Development ... 12
Norton Co. ... 109

Ohio Seamless Tube Division of Copperweld Steel Co. ... 86

Philadelphia Gear Works, Inc. ... 34

Ransburg Electro-Coating Corporation ... 81
Ren-ite Plastics, Inc. ... 150
Republic Steel Corporation ... 82, 83
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation ... 85
Ryerson, Joseph T., & Son, Inc. ... 44

Service Steel ... 148
Sewall, E. B., Manufacturing Co. ... 146
Shenango-Penn Mold Co., Centrifugal Castings Division ... 116
Silent Hoist & Crane Co. ... 156
Simmons Machine Tool Corporation ... 65
SKF Industries, Inc. ... 2
Standard Pressed Steel Co. ... 20
Superior Steel Corporation ... 35

Tennessee Coal & Iron Division, United States Steel Corporation ... 129
Texas Co., The ... 38
Timken Roller Bearing Co., The, Steel & Tube Division ... 62
Tinnerman Products, Inc. ... 66
Toledo Stamping & Manufacturing Co. ... 148
Tomkins-Johnson Co., The ... 145
Torrington Co., The, Swager Department ... 30

United States Steel Corporation, Subsidiaries ... 129
United States Steel Export Co. ... 129
United States Steel Supply Division, United States Steel Corporation ... 129

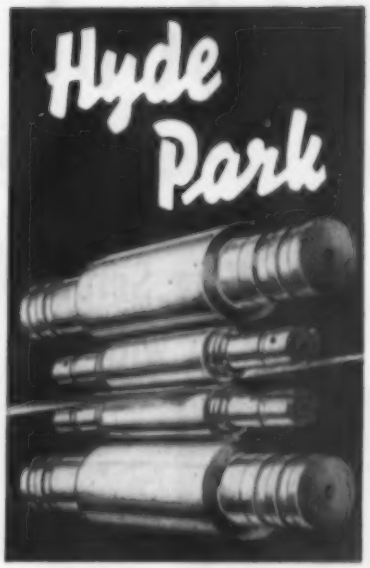
Vanadium Corporation of America ... 140
Vaughn Machinery Co., The ... 99
Victor Equipment Co. ... 113
Virginia Gear & Machine Corporation ... 24

Wairton Steel Co. ... 31
Western Automatic Machine Screw Co. ... 25
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation ... 100, 101
Wilson, Lee, Engineering Co., Inc. ... 155
Wisconsin Motor Corporation ... 131

Yoder Co., The ... 18
Youngstown Sheet & Tube Co., The ... 28

Table of Contents, Page 5

Classified Advertising, Page 155



Red Circle Rolls for all Purposes

The Red Circle on the Roll is the Hyde Park mark of Quality. Hyde Park makes rolls for every type mill.

Chilled Rolls
Alloy Iron Rolls
Moly Rolls
Nickel Chilled Rolls
Grain Rolls
Cold Rolls
Sand Rolls

for
Finer Finish, Longer Life
and Greater Tonnage
specify Red Circle

Hyde Park

FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.
ROLLS • ROLLING MILL MACHINERY
GREY IRON CASTINGS

(Advertisement)

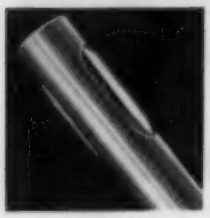
Tool Steel Topics

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

They Wing Screw Drivers at Fast Clip with Dies of BTR



It's efficieney-plus at the busy plant of Oxwall Tool Co., Ltd., Oxford, N. J. For here there's every kind of machine for the high-speed manufacture of all kinds of quality screw drivers. They turn them out by the millions, large and small, including an ingenious worm-like screw driver which can be bent around corners at the touch of a finger.

The plant has a battery of 10-ton presses where the wire blank is winged on the end opposite the blade (see illustration above) so that it can be anchored in the plastic handle. The typical forming dies used in this operation are made of BTR (Bethlehem Tool Room) tool steel. Oxwall engineers tell us that these BTR dies, hardened to Rockwell C48-50, are giving long service life in this application.

BTR is our general-purpose, manganese-chromium-tungsten grade of oil-hardening tool steel, perhaps best known for its safe hardening property. It also has good abrasion-resistance and toughness, and is ideal for practically every application where long wear is desirable.

If you would like to give BTR a workout in your shop just put in a phone call to your Bethlehem tool steel distributor. You'll find him well stocked with BTR, and anxious to be of service to you.

Assortment of screw drivers made by Oxwall Tool Co., Ltd. Each blank is winged by a die of BTR tool steel, for firm anchorage in handle. Model shown in illustration at the upper right, with flexible shaft which can be bent as needed, is an ideal time-saver for cramped quarters.

SHOCK-RESISTANCE PAYS OFF AS DIE MADE OF 67 CHISEL PUNCHES HOLES IN HIGHWAY GUARD RAIL

Because of its excellent shock-resisting properties, this die of Bethlehem 67 Chisel tool steel provides economical punching of bolt holes in beam-type highway guard rail. The die, hardened to Rockwell C-51, operates in a 200-ton press. In addition to its shock-resistance, 67 Chisel is wear-resistant, making it ideal for such applications as shear blades, hot-work tools, blanking tools and swaging dies.

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Here's How to Harden Tools with Holes

Ordinarily holes in tools cannot be eliminated. Nor can their size or location be changed, in most instances. So steps must be taken to control the ill effects of holes, such as tools cracking during the hardening operation. Although it is impossible to outline a procedure for all tools, the following principles are recommended for those containing holes:

1. Quench tools so that the internal surfaces of the tools harden completely. When holes are relatively large, no special attention may be necessary; for small holes, flush-quenching may be required.

2. If it is possible that effective quenching may not occur completely throughout the holes, pack them so that hardening cannot take place in the holes, assuming that this condition is allowed on the tool. Use clay, asbestos, steel wool or steel inserts.

3. If only the surface of a hole is to be hard, as on a ring die, flush-quench the bore while protecting the outside surface from the quench.

The internal surface of a hole should be either uniformly hard, or uniformly soft. The worst possible condition is an irregular hardness pattern on the inside surface, because the high stress developed may result in cracking.

• Cleveland worm gear speed reducer installed on a Mesta 45" slab shear in a large eastern steel company plant.

CLEVELAND keeps 45" slab shear running steadily

TO keep up with the speed of the mill, the 45" slab shear pictured must cut rapidly and steadily. It's punishing work—calls for a thoroughly dependable drive for the shear. With a Cleveland worm gear drive handling the job, shearing keeps pace—operations run on schedule.

Cleveland worm gear speed reducers are used on all kinds of tough jobs, wherever dependable power transmission is vital. Easy to see why, too. Compact and space-saving, Clevelands have high shock load resistance. The case-hardened steel worm and long wearing nickel-bronze gear actually improve with use. Even operating under continued, severe overloads, danger of sudden failure is remote. Torque flow is smooth and uninterrupted. Gearing is enclosed in an oil bath, assuring positive lubrication, safety for operators, minimum maintenance.

Thousands of Clevelands are on the job after years of hard work, as efficient as the day they started. Get the full story. See how they can help improve *your* operations and profits. Write for Catalog 400. The Cleveland Worm & Gear Company, 3270 East 80th St., Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

WHAT'S NEW IN MOTOR CONTROL? ★ ★ ★ GET IT FIRST IN CUTLER-HAMMER

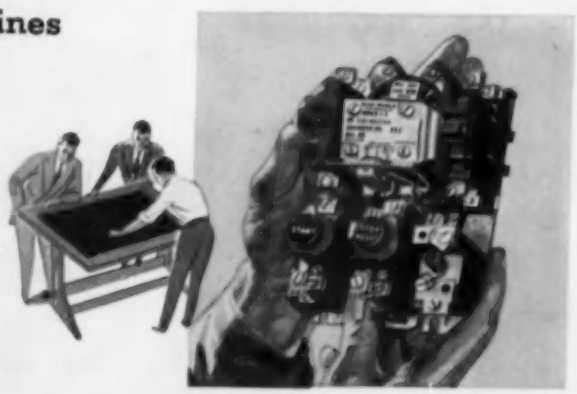
Now industry's three-phase motors can have full three-phase protection with standard in-stock motor control!

Many motor users have proved *two* overload relays are inadequate protection for three-phase motors. In fact, widespread motor burnouts due to inadequate motor protection have caused amendment of Section 4327 of the National Electrical Code. The code now permits authorities to *require* three overload relays in three-phase motor control . . . and this provision is already being enforced in some areas. Many safety experts and power engineers say the time is not far off when three-phase motor control with less than three overload relays will be unacceptable.

The use of three overload relays is not new. Many industrials plagued by recurring motor burn-outs and the resulting intolerable operating interruptions have changed to three-relay control. But such changeovers have been slow to effect and costly as no standard control was available with three overload relays. Special constructions and enclosures have always been required.

The BIG news today is that this is no longer true. The new Cutler-Hammer ★★★ Motor Control offers *three* overload relays in all standard starter constructions and enclosures. You pay only for the third relay, nothing additional for special engineering or manufacture. No extras. No delays. It is *in stock* at your nearby Cutler-Hammer Authorized Distributor. Order it today and use it tomorrow. CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wis.

CUTLER-HAMMER
☆ ☆ ☆
MOTOR CONTROL
C-H

For designers of machines and special control panels

The unit panel construction of Cutler-Hammer ★★★ Motor Control makes it easy to incorporate starters with three overload relays. Starters mount in place with only three screws, require no more space than starters with only two overload relays. NEMA Sizes 0, 1 and 2 starters and all parts thereof are now available as components. Also a complete companion line of control relays with quickly interchangeable NC-NO contacts. Be sure you have the latest design data on this advanced equipment. Write or wire today.